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THE STATUS OF BEHAVIORAL MEASUREMENT AND ASSESSMENT IN CHILDREN.

BY- JENKINS, W.O. AND OTHERS
CITY UNIV. OF NEW YORK,INST.FOR CHILD DEV./EXP.ED.
CENTER FOR URBAN EDUCATION, NEW YORK, N.Y.

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THIS PAPER PRESENTS INDEFINITIVE APPROACHES FOR THE BEHAVIORAL ASSESSMENT OF PRESCHOOL CHILDREN. IT REVIEWS THE STATE OF THE ART OF BEHAVIOR MEASUREMENT OF PRESCHOOL CHILDREN AND SUGGESTS SOME NEW OR MODIFIED MEASURES. AN INTRODUCTORY OVERVIEW DISCUSSES REASONS FOR BEHAVIOR ASSESSMENT AND FACTORS WHICH AFFECT ANY BEHAVIORAL APPROACH. SOME PROCEDURAL CONSIDERATIONS AFFECTING ANY RESEARCH WITH PRESCHOOL CHILDREN ARE GIVEN. THESE CONSIDERATIONS DEAL PRIMARILY WITH DIFFICULTIES THAT CAN ARISE WITH THE PHYSICAL SETTING AND WITH INTERPERSONAL RELATIONSHIPS. MAJOR AREAS FOR BEHAVIOR ASSESSMENT ARE SURVEYED--(1) OBTAINING BACKGROUND AND ENVIRONMENTAL INFORMATION, (2) LEARNING, (3) SENSORI- AND PERCEPTUAL-MOTOR ACTIVITY, (4) LANGUAGE AND VERBAL BEHAVIOR, (5) ATTENTION AND MOTIVATION, (6) EMOTIONAL BEHAVIOR, AND (7) SOCIAL BEHAVIOR. IN EACH OF THESE 7 AREAS, THE BASIC CONCEPTS INVOLVED ARE EXPLICATED, CURRENT EXPERIMENTAL WORK OR THEORIES ARE SURVEYED, AND SPECIFIC PROPOSALS FOR APPLYING EACH TYPE OF ASSESSMENT TO PRESCHOOL CHILDREN ARE GIVEN. (DR)

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THE STATUS OF BEHAVIORAL MEASUREMENT AND ASSESSMENT IN CHILDREN

W.O. Jenkins, Stephen Zeigfinger, Barbara Frengel,

Lawrence Birnbach and Helaine Gold

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The Institute for Child Development and Experimental Education

of The City University of New York

and

The Center for Urban Education

ABSTRACT

This paper contains a program for behavioral assessment of the pre-school child. Specific tasks and instruments are presented for the following areas: Background Information and Environmental Variables; Learning and Cognitive Processes; Sensori- and Perceptual Motor Activity; Language, Verbal Behavior and Communication; Attention and Motivation; Emotional Behavior; and Social Behavior.

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OVERVIEW

W. O. Jenkins

This paper attempts to review the state of the art in measurement of child behavior. It consists, basically, of 1) a review of selected literature in various areas of child research and 2) suggestions for new or modified assessment measures in the current program.

The focus of the paper is, by definition, on assessment. It is hoped that ultimately a battery - or more likely a series of sub-batteries - can be provided from which various investigators can pick and choose for their immediate purposes. The breakdown of behavioral areas that follows was teased out on an a priori basis; there is nothing magical or immutable about it. Like any rubric, it is far from exact, shows fuzziness and overlaps around the edges. It is, however, workable and useful for the nonce. Each of these areas will be treated in turn in later sections.

1. Background Information and Environmental Variables.
2. Learning: Conditioning, Discrimination, Learning, Concept Formation, Problem Solving, Creativity and Memory.
3. Motor Activity.
4. Language.
5. Attention and Motivation
6. Emotional Behavior
7. Social Behavior

At this point a comment is needed on the scope of the project. First, it is clearly a continuing project. Our research efforts will be concentrated on sampling the child's behavior as a many-faceted die in order to obtain a reasonable picture of his capacities and capabilities. To paraphrase John Donne, no behavioral trait or activity is an island.

They overlap and interlock. This point may provide some short-cutting. For example, Emotional Behavior ("Affectivity") may well come out in the other experimental washes. Some indicies of Social Behavior may also be picked up in the course of other measurements. No matter how it's sliced, it's a big deal and the current research group can be asked for little more than a rough, first-go-round approximation to a polished, precise battery. A reasonable estimate of what would be required to really wrap the job up would be a staff of a dozen or more full-time researchers for three years after the initial spade work has been done.

With the apologia behind us we can turn to more immediate matters. Assessment is a major step in the three-pronged approach to all behavioral research: selection (or prediction), training and criterial measurement. (Assessment, training and the criterion have been the topics of separate, previously-issued papers (Jenkins, 1966a, 1966b, 1966c).) These three enter, with greater or lesser emphasis, into all behavioral investigation. The epitome of them is the classical transfer of training experimental paradigm. In all research Ss are selected (at least haphazardly), experimental treatments applied and behavioral measurements taken. There is no other way.

There are several reasons for assessment. (Incidentally, for our purposes the word "evaluation" is reserved for personal or professional opinions regarding some one else's research.) One is for assessment itself - a kind of behavioral demography. We might be interested per se in the language, learning or perception of the Micronisians or Swahili. In actual practice, of course, most investigators will end up with cross-

cultural comparisons of some kind or other. Secondly, assessment at an earlier age level can serve as a predictive basis for later behavior in and out of the classroom. Finally, and most immediate, a number of training programs have sprung up like cotton-weed as a result of Headstart. Training by itself is meaningless and cannot take place in a vacuum. It must be coupled with assessment. The point is obvious and needs no belaboring. Planning for training and assessment should start simultaneously and continue hand in glove.

A comment is called for regarding generality. First, practicality has to be faced up to. Wherever possible, everyday objects should be used in assessment, particularly because the materials frequently have to be portable. This matter precludes elaborate instrumentation and prevents common employment of measures such as EEGs and muscle action potentials. On the other hand, generality is a highly desirable goal. If the materi-.als and measures can be employed over a wide age and/or species range, generality is enhanced.' Many such measures are available in the classical comparative literature. They will be noted later.

If Hull (1943) contributed nothing else to the behavioral literature - and he did - his emphasis on spelling out the investigator's systematic position behind research was basic. What are needed here are brief comments on both theory and methodology. All theory is, by definition, biased and this one not less so. The most parsimonious and comprehensible (as well as practical) of current learning theories is contiguity. Learning by contiguity bypasses the metaphysical and behavioral morasses in which the drive-reduction position bogs down. Contiguity is superficially simple, but quite complex in depth. A stripped-down version of it goes:

the terminal response when it occurs, is conditioned to the cues present so that there is an increased probability for reoccurrence of the behavior the next time some portion of the original stimulus compound is re-presented. "Reinforcement" consists of change in stimulus conditions with a corresponding change in behavior so that the previous stimulus-response associations remain intact. These statements have many implications and ramifications. Generalization, cue change and constancy, and response decrement are at the heart of the matter. A previous paper (Jenkins, 1966b) spells out, in part, the role of generalization in behavioral research and training experiments.

From a methodological and measurement standpoint, we deal with the surface behavior of the organism no matter what our theoretical bias. Furthermore, since the typical child - or lab rat for that matter - has had very little extirpative work done on it and has few wires hanging from it, we deal with intact organisms. (This is not to deny a place at the research table to the physically disadvantaged, but they are not in the focus of the investigatory spotlight.) What we measure are basic dimensions or parameters of behavior. All behavior and its properties - responses and response classes - are measured in whole or in part by members of the following listing:

Frequency	Amount
Rate	Variety
Latency	Conditions
Intensity	Direction
Duration	Quality (Correctness)

The details of these basic dimensions are spelled out in detail elsewhere (Pascal & Jenkins, 1961; Jenkins, 1966a). Suffice it to say that some classes of behavior require only one measure (conditioned salivation-amount) while others need several (sleep - Frequency, Latency, Intensity (Depth), Duration, Variety, and Conditions).

In working with young human organisms there are usually a number of built-in parameters. These include the obvious ones of age, socio-economic status and sex. In deciding on sample characteristics these will clearly be included in any research program on assessment of children.

SOME BASIC BEHAVIORAL POSTULATES

A mass of words is flung around and about regarding training and assessment research with children - more and less advantaged or deprived - prior to an following their school entry. Many of these are sound and fury, confusing rather than air-clearing. Implicit in most of this verbiage are certain assumptions. These vary in the extent to which they are pure speculation, experimental questions or founded in experimental fact. It seems wise to list a few that have reference to experimental findings. They follow.

1. Genetics Genes are real and not imaginary. Further, they cannot, at least at this stage of scientific advancement, be replaced or modified in children. There is no substitute for "good" or "poor" genes. They set a clear ceiling on attainment. There definitely is such a concept as "genetic deprivation" as well as "cultural deprivation". This point must be kept in mind. It demands a careful behavioral examination of hereditary and constitutional features of the organism under experimental scrutiny and of its forebearers. This variable merges over into that of

the social milieu of the subject.

2. Physical Environment Organisms whose natural habitat restricts the availability of food, water or oxygen (or provides an over-abundance of these substances) behave in a way (not only with respect to these stimuli) different from an organism not treated by or exposed to such an environment. Runted and stunted organisms are produced,for example, by an environment with a low food supply. Temperature plays a major, more direct behavioral role: the higher the temperature, the slower the learning. These environmental features must be examines (or investigated) in working up research programs for a particular group of organisms.

3. Cultural Milieu Everyone knows this one so it requires little discussion. The cultural atmosphere obviously conditions behavior on a whopper scale - drawing it out within the limits set by the environment and genetic factors, of course. People from Brooklyn rarely speak Swahili and vice versa. One point needs stressing. The incomplete information available suggests the possibility of an irreversible process: events changing behavior in early life may have a lasting impact. The first three premises lead into the catch - all one of:

4. "Individual Differences" The trite and garbage-pail nature of this concept notwithstanding, gross differences do exist in genetic make-up and past experience across individuals that contribute largely to behavior. The issue is to identify classes of variables within this rubric.

5. Early Experience Early stimulus events, responses to them, and associations built up between the two classes influence later behavior on a large scale and in a predictable fashion. The predictions hinge, of course, on identification of the early experiences. They can be identified

of only in a gross retrospective manner.

6. Behavioral Change Forgetting is a useless concept. Behavior is replaced; it does not fade away. New behavior is conditioned to the stimuli that once evoked the old. The way to new behavior is paved with stimulus change. Alterations in the cue setting produce decrements in the original behavior and, by definition, replacement of it by new reactions. Generalization, generalization decrement, and stimulus and response similarities and dissimilarities are the keys to behavioral replacement.

7. Generalization and Transfer Behavior carries over to different situations as a function of the similarity of the new setting to the old one. To hold behavior constant, hold the stimulus situation constant; to change behavior, change the stimuli.

8. S - R Interaction For any organism, current behavior is an interactive function of present stimulation, past stimulation and reactions to it and the relationship between the past and present situation and behaviors, remembering that "stimuli" cannot be defined without responses by some organism.

9. The Role of Theory Research in this area, as in other behavioral areas, can be conducted without reference to a theoretical framework, but it's a lot easier and more fruitful to have one. A systematic position is a must; without it the research world becomes a botanizing hodge-podge.

10. Methodology Experimental approaches in this field are exactly the same as in any other behavioral research: present or change stimulus properties and observe, measure and record response characteristics. Heavier leaning on the comparative (animal) literature will facilitate progress in research on assessment and training. Greater organismic versatility may lead to increased behavioral variability and somewhat less standardization and control.

RESEARCH WITH PRE-SCHOOL CHILDREN:

SOME PROCEDURAL CONSIDERATIONS

Stephen Zeigfinger

The general purpose of this section is to point out several of the methodological and procedural difficulties encountered when conducting research in the pre-school setting. More specifically, we wish to identify and clarify some of the problems that confronted us at the outset of our investigation, in the course of acquainting ourselves with the Ss in our sample.[1] In addition, we will attempt to suggest ways in which these problems can be avoided or, at least, better handled. Our emphasis will be on the more subtle problems encountered in research of this kind, although we will try to comment on some of the more obvious and frequently occurring errors.

We believe that the source of the greatest number of errors in this type of research is interpersonal in nature. That is, the initial contact that the research team has with the personnel of the day-care or pre-school center is crucial and can often determine the eventual success of the research project. Here our focus is upon the initial process of obtaining a subject pool and the ensuing procedural considerations which need to be taken into account in order to maintain this often tenuous relationship. The problem of procuring Ss is rarely noted in the literature but is certainly one that is growing, particularly in the light of the psychologists' desire to do research with organisms other than rats and college sophomores.

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1. Ss are from the Open Door Day Care Center in Manhattan. We wish to thank the director, Mrs. Allen, for her cooperation during the course of this research.

PHYSICAL ASPECTS OF THE RESEARCH SETTING

The physical construction of the research environment has become an important part of research strategy and procedure. There is a growing trend in the area of child research to "do the dirty work" in the child's habitat rather than in the psychologist's traditional refuge- the laboratory. Because of this geographic switch there is now more emphasis on the physical construction of the natural laboratory including access to "pure observation" and the heretofore almost completely neglected concern- comfort.

Access to Pure Observation

The physical arrangement and construction of the research setting effects, in many cases, the overall strategy employed by the experimenters in the investigation of their specific problems. For example, in a research area where familiarization with the sample population is required before actual experimentation is undertaken, observing the subjects in their natural setting is customarily carried out. This particular method requires the team of researchers to observe and record the various behaviors of the child. This can either be done in a free-play or a more structured situation. In both cases however, the observer attempts to remain outside of the situation, i.e., he must not be seen by the child. The extent to which this pre-requisite is met determines the purity of the observation. If the child can see the observer the situation is vastly different from a condition in which the observer cannot be seen. The stress here is on consistancy. That is, if pure observation is required for the research, the observer should never be seen. Even if pure observation is not a specific methodological requirement, it still remains

an experimental necessity not to "mix-up" the observing methods. In other words, which method is used and under what conditions it is utilized is important. Systematic manipulation of observational methods permits the investigator to make relatively conclusive remarks concerning the influence of the methods used under certain specified conditions. Random or unsystematic manipulation results in hunches or "intuitive" feelings about the effects of certain variables.

In most instances "pure" observation is not possible. The construction of the natural settings, i.e.,indoor play rooms, are not made for this purpose. The doors often have windows but they are almost always too small to permit a limited visual range. The doors are usually located at one end of the room so that even if the windows were large enough, only part of the room could be seen. This positioning problem refers to windows too. "Observation windows", not originally designed for this purpose, are located at one end of the room allowing only a partial view of the play area. One way of remedying this visual problem would be to build in one-way mirrors at strategic points in the room. This would permit flexibility in terms of one person observing from several different vantage points and in terms of different people observing at the same time. This method lends itself nicely to observer reliability checks which are crucial to systematic research of this kind.

The one-way mirror approach seems to be the only method that insures pure observation. Any other method, even one which has regular mirrors located at suitable positions around the room, allows the child to be distracted by the observer and thereby alters the situation. On

the basis of our experience we believe that unless one-way mirrors are used, direct manipulation of the child's behavior and observation of the responses is the only alternative. That is, unless pure observation can be guaranteed the experimenter should not fool himself into believing that it makes no difference if the child can see him. If pure observation is not possible then it seems that the most fruitful recourse would be to enter the natural setting, become involved with the child's ongoing activity, initiate direct manipulations of this activity, and record the behavior that results from this purposeful intrusion.

Comfort

Because the child spends up to one hour in an experimental session he must be made comfortable. The advent of furniture specifically designed for children has gone a long way in alleviating this previously aggravating problem. Ventilation can be a problem, especially when doing research in a school where the windows are often fastened for safety purposes. This condition makes it uncomfortable for both the child and experimenter.

Because children generally become restless in an experimental session it is desirable to have a variety of benches, tables, and chairs available in the room so that the location of testing is not an important factor. We have found that a bored and fatigued child becomes a "new" subject when he is permitted to move to a different area in the room. A note of caution should be interjected here. Although it is desirable to have duplicates of the basic materials it is often undesirable to have many toys, typewriters, or any other incidental stimuli around which might serve to only distract the child. Children are in-

trigued by all sorts of machinery and can spend a great deal of time attending to these distracting objects, remaining oblivious to the experimenter. This kind of "natural" curiousity might be used, of course, to advantage in a different experimental context.

A factor that is generally taken for granted in psychological research is the comfort of the experimenter. When an experimental design is formulated and such variables as the length of the session, the size of the sample, boredom, and fatigue are discussed they refer only to the subject. The implied assumption of this approach is that the experimenter is not susceptible to the same kinds of psychological and physical impediments as the subject. Participation in a research project, particularly one with child subjects, will quickly eradicate this "common sense" conception. As a matter of fact, the child can usually spend a greater amount of time in "session" and become less fatigued and bored by the tasks than the experimenter. The specific effects that this fatigue factor has upon the outcome of the sesssion are as yet unclear and, there are no simple solutions to the problem. There are, however, several ways of approaching the situation.

One alternative would be to increase the number of the experimental sessions but at the same time decrease their duration. This alteration would keep the total amount of time the same and decrease the effect of the fatigue-boredom factor. Another possibility would be to rotate experimenters and keep the duration of the experimental sessions relatively long. This would enable the investigator to defend against the accusation that nothing really meaningful can be done in a very short time. Certainly more

research is needed before we can be sure as to the optimal length of the experimental session. This is an extremely difficult question to answer primarily because the optimal time probably would vary according to the nature of the training and/or assessment. Rotating experimenters, in addition to possibly eliminating the fatigue problem, might also control for differential interaction between the sex of the experimenter and the sex of the child. Other subject characteristics such as expectation, aggressiveness, and voice quality which under ordinary circumstances might confound the data, would be controlled for using this rotation paradigm. This does not mean that we would change E's in the middle of an experimental treatment.

A third way of handling the boredom-fatigue factor would be to enhance the general experimental environment. This might be done by having the room tastefully painted, gaily decorated, and comfortably furnished. A coat rack, rest room facilities, a telephone, and a lounging area may seem to be absurdly ordinary accomodations but they can make E very happy.

INTERPERSONAL RELATIONSHIPS

One of the more significant problems of child research is that of obtaining Ss. This is becoming an increasingly thorny dilemma primarily because of 1) a greater demand for a wide age range of children because of the psychologists revived interest in the study of developmental phenomena, 2) the pressing need for more school-aged children because of the increased interest in psycho-educational problems and 3) the school systems resistance to psychological research because of ethical and administrative issues. While the need for more school-aged children is growing their accessibility is decreasing rapidly. The private schools are

generally more amenable to psychological investigation than the public schools but even they are hesitant in sanctioning research. This situation has created a complex problem for the concerned researcher and has underlined the tremendous responsibility that the researcher accepts when he does gain access to a school. In a very real sense, every time a researcher enters a school or pre-school center he is representing the entire profession. His behavior and the actions of his research team determine future decisions of the school concerning the availibility of the facilities to subsequent investigators. This section will deal with the problems encountered by the research team when they attempt to obtain a subject sample and the nature of the interpersonal relationships that are involved in maintaining rapport with the school staff. This is a necessary condition for successful research. Successful research in this context does not refer to the substantiation of specific hypotheses but rather to whether the research team has built a friendly and viable foundation which will allow investigators to enter the school or day-care center on future occasions.

Initial Contact

It is hard to over-emphasize the importance of the first contact that the researcher has with the person in charge of the school or day-care center that is to be used as the source for subjects. This first contact is usually by telephone. The main purpose of the telephone conversation is generally to obtain an interview with the director of the school so that a more detailed explanation of the purpose of the research can be undertaken. The telephone contact, in one sense, is only a prelude

to the more important meeting but it should be reiterated that the telephone conversation can determine the nature and rapport of the direct personal confrontation. It is not necessary at this point to report the findings that support expectancy and set theory but let it suffice for now to say that pre-conceived notions are powerful determinants of both perception and behavior.

The telephone talk is generally brief and to the point. The time of the interview should be left to the discretion of the director of the institution. It is often helpful to write down the details of the phone conversation in order to be better prepared for the personal interview. It is possible that the director will ask questions regarding specific research instruments and will want to see them. A brief account of the telephone conversation serves as a reminder for these kinds of things.

Before the first personal interview takes place the researcher should have the objectives of the meeting clear in his mind. This procedure permits smoother communication between the researcher and director and probably, more importantly, gives the impression that the investigator has already thoroughly thought through the problems of the proposed research. The first objective, of course, is to establish rapport. It is at this point where the initial telephone conversation becomes important. If the tone of the conversation was warm and friendly then there are no problems. If, however, there was some confusion, then the immediate concern of the researcher has to be to straighten things out and establish the desired rapport.

The next two objectives are interdependent but for the purpose of

clarity will be discussed separately. It is extremely important for the researcher to spell out the proposed research very clearly in the beginning. That is, the general problem or idea should be explained and the specific hypotheses should be stated. The method and procedure need to be stated exactly as they are going to be implemented in the investigation. If the experiment involves giving the child a reward, and most child research does, then the type of reward and how often it will be presented must be explicated. This brings us to the third objective; the establishment and clarification of the rules and regulations. This involves the discussion of the rules of the school and the manner in which the director views certain methodological techniques. For example, does the school require parent permission slips before the child is allowed to participate in psychological research? Does the director feel that M&M's are inappropriate reinforcements because they tend to spoil the child's appetite? If the children in a particular classroom are used in the experiment is it necessary to give rewards to all of the children regardless of whether they were subjects in order to prevent jealousy among the children? These questions need to be answered prior to any experimentation. It is crucial to involve the director in these problems because it is very likely that she (the directors of pre-school centers are almost always female) is more aware of these problems than the investigator. This mutual involvement has a fourth and probably the most important purpose. Every effort should be made to insure that the director feels important and that she is, in fact, an integral part of the research project. Unless she feels that the researcher is concerned with her and the school, unless she is

aware that the researcher is sensitive to the previously mentioned problems, and unless she feels that the researcher is competent and sensible enough to consult her about unanticipated problems, she likely will be uncooperative. If, on the other hand, she feels that the researcher is sensitive, alert, and concerned with the possible obstacles and she has been involved in some of the policy decisions she will not only be cooperative but generally will give the investigator a free hand. It is conconceivable, of course, that his freedom concerning procedural matters, may lead to some self-doubt and certainly to a greater portion of the responsibility. We have found however, that the freedom obtained as a result of establishing "good rapport" is infinitely more preferable to a structured, formalized setting. In addition, it is easier to go from an unstructured to structured situation than the reverse. That is, once good relations are established with the school administration it is quite simple to modify the situation. Whereas, if the relationship is strained either as a result of initial difficulties or procedural errors, a great deal of time and effort must be spent attempting to alter the nature of the relationship rather than changing the procedure. Although we have no systematic empirical evidence concerning the researcher-director relationship and its effect on the success of the research project, our observations suggest that it can strongly influence the outcome of the research.

Experimenter-Teacher Interaction

Without the teacher's willing cooperation it is virtually impossible to establish initial rapport with the children. The teacher is particular-

ly important because she provides immediate access to the children. If the researcher-teacher relationship is friendly and non-threatening, many of the potentially aggravating subject problems are taken care of at the outset. For example, if the children sense any hostility between the teacher and the stranger who enters their room no amount of coaxing will convince them to go with the investigator. On the other hand, if the children sense that the researcher and teacher are friends they will go and some of the initial fears and hesitation will be eliminated.

Although it might sound simple, establishing non-threatening and friendly rapport with the teacher is quite often a difficult task. Because the researcher is the outsider, so to speak, it is important for him not to come on too strong. The fact that the researcher would like to learn about some of the children in the class should be introduced clearly and patiently. The teacher will almost always respond in an affirmative manner if she does not feel that the researcher is trying to take over the classroom. At this point it is advisable to give the teacher the lead, let her direct the removal of the children. This initial procedure makes it much more comfortable for the children and also breaks the ice for the researcher. If this preliminary step goes smoothly it won't be long before it becomes a self-generating system. Once the children come to know the researcher they eagerly await his arrival and are ready to go with him.

There is one last point concerning the establishment of rapport between the teacher and researcher. As with most any group of people, teachers display a great variety of individual differences. This fact

is often overlooked and as a result many researchers have a preconceived notion of what a teacher is like in terms of temperament and needs. These preconceptions can produce unfortunate results. Teachers vary in their "styles" of teaching as well as in their receptiveness to researchers. Some teachers will almost immediately accept the researcher as a colleague on a common mission while other teachers will see the researcher as an intruder. The responsibility for rectifying this unfortunate situation falls upon the researcher. Whether or not this is the way it should be is irrelevant, it is a fact of life. Perhaps the possibility of encountering a distrustful teacher has been exaggerated but if it succeeds in alerting enough people to "just that one chance" then the elaboration is warranted.

Experimental-Child Interaction

We have found that the variable which is most apparent and most difficult to deal with is the child's fear of the unfamiliar. A great majority of the children we have worked with have exhibited, especially on first contact, a very noticeable and disquieting fear. Although our sample was small and perhaps biased it hardly seems credible that children of other social classes and age groupings, at least to some degree do not behave in a similar fashion. Professor Boehm has found that the main distinguishing characteristic between lower and middle class children is the lower class children's fear of strangers (in this case the experimenter).* It seems from our work that this fear of the unfamiliar generalizes to most

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* Personal Communication

aspects of both the interpersonal and experimental situation. We have found that careful planning must be undertaken in order to take account of the factors that might produce anxiety. For example, the children in our sample almost invariably became immobilized when confronted with an unstructured task. These children rarely guessed, they only responded when they were sure of the answer. When the experimenter encouraged them to venture a guess they became uncomfortable and would either remain silent or giggle nervously. Because of this "built-in" fear the experimenter needs to carefully regulate, and be keenly aware, of his own behavior.

If the researcher succeeds in obtaining the teachers cooperation, removing the children from the classroom becomes a less complicated problem. Despite the fact that all might be well between teacher and researcher there are still some children that will not budge. It is best to leave these children alone in the beginning and allow them to observe the exit and return of some of the more uninhibited children. The first step then is to identify the "ready" children and take them to the "laboratory". In the beginning even the most friendly child will become afraid and quiet once he is in the hall on the way to the experimenters "turf". There are no quick-and-dirty ways to eliminate the child's initial fears but certain things can be done to partially alleviate them. A good start usually is to introduce yourself and then ask the child for his name. If the child responds without further prompting then the way has been smoothed.

We have found that the best initial approach is to set aside the first session for a warm-up. In other words, instead of immediately be-

ginning the planned research, an alternative method which has the advantage of giving the child an emotional and attitudinal set, is desirable.

Children are extremely sensitive to adult uneasiness and the put-on behavior which is often the result of this uneasiness. We have thus far emphasized the child's initial fear, but the picture would not be complete if we did not discuss the experimenter's trepidation and anxiety and the overt behavior which results from this aroused emotional state. The child's reaction to the researcher's behavior in this context is also worth examining.

An aspect of child research which is often overlooked is the researcher's previous experience with children and how this experience has affected his present attitudes and behaviors toward them in an experimental setting. There are some researchers who are "naturals" when it comes to relating to children. There are some who are scared to death of children and others, who although they are not exactly afraid, still have some difficulty dealing with children. Let us point out in passing that the "natural" is a rare bird and for practical purposes does not exist. This situation suggests that part of any child research program should involve active participation with children, especially in an experimental setting.

That both the child and the experimenter are initially nervous suggests that the first session should be a warm-up meeting. If the experimenter is nervous and refuses to accept it then chances are he will either come on very strong or else be patronizing. The child will immediately sense this "phony" behavior and the probability of establishing

a working relationship will be greatly diminished.

The primary objective of the initial session is to make both the experimenter and the child comfortable. Assuming that it takes less time for the researcher to lose his inhibitions the remainder of the time can be devoted to"loosening up"the child. It is sometimes advisable to permit the child to determine the atmosphere on the first session. It is important to remember that the child will be coming back. The first session should not be stretched out. Perhaps the best time to terminate the meeting is when the child begins to show signs of boredom. Some children however, will never become bored and it therefore becomes necessary to make sure that the child does not think that the reason the session is over is because he has behaved in an undesirable manner.

The last factor we shall consider under this heading is the child's return to the classroom. The procedure that is used will, of course, depend upon several factors. If, for example, many subjects are run in a short time then a relay system would probably be appropriate. That is, when the child is through in the experimental room another researcher would escort the child back to his room. If, on the other hand, different sexed experimenters were involved in this relay system it might be decided that the experimenter take back the child by himself. In any case we have found that the walk back to the classroom can be a source of enjoyment for the child. The business has been taken care of and now there is time for some kidding around. The experimenter's ability to establish rapport with the child is measured when the experimenter returns the next time and sees the children eagerly waiting for their turn to leave the room.

Experimenter-Experimenter Interaction

Research in the pre-school setting generally requires the presence of several research workers. This situation is quite different from the usual laboratory condition in which there are a subject and an experimenter. This increase of people produces a situation which can cause some difficulty. It might not be necessary to have some one in charge of the operation but it is important to have the tasks clearly spelled out and know who is responsible for what job.

The research team should be careful to avoid discussing the research strategy in front of the children. This kind of conversation will only confuse the children and annoy the experimenters when they realize what they are doing. The discussion of what should be done next can almost always be avoided by clearly enumerating the various jobs and responsibilities before starting any formalized experimentation. Pilot testing can smooth out these procedural bugs and supply information about some previously unanticipated interpersonal and methodological problems.

1. BACKGROUND INFORMATION AND ENVIRONMENTAL VARIABLES

W.O. Jenkins

A great deal of research time on the part of many investigators - prior to Freud - has been devoted to these topics. Many of these studies have been retrospective in nature, i.e., the adult organism is interviewed regarding his recall of environmental circumstances in his childhood, particularly the behavior of parents and parental surrogates toward him. Methodology and findings in this area have been treated in detail elsewhere (Pascal & Jenkins, 1961). One advantage of the current type of assessment program is that the child provides an objective springboard for direct observation. That is to say, the actual behaviors of parents and sibs toward the child can be observed rather than interpreted in retrospect. What is needed here is a detailed estimate of the extent to which the environment is meeting the child's needs for nurturance, succorance and safety. Put in other terms, how much deprivation is the child experiencing?

Specifically, it is planned to employ four indicies in this area: the Pascal-Jenkins Behavioral Scales, The University of Tennessee Deprivation Scale and an estimate of socio-economic status (SES), (Pascal & Jenkins, 1961). The last one is the child Information Form collecting data from interview of the child. The first will deal with the behavior of parents, older sibs and other relatives toward the child. Interviews will be employed, but the basic data will emerge from direct observation. The behavioral areas to be considered will include:

Parental activities with the child

Providing and supporting behavior by parents

Intellectual behavior of parents

Parental goals for child's education and future

Verbal and physical displays of affection by parents

Verbal and physical punishment and restraints imposed by parents

Estimate of parent's deviation from behavioral expectancy

In addition, the parents will be queried regarding the child's activities in the physical, social, emotional and intellectual spheres.

Complimenting this information, the child will be observed and questioned regarding his activities and those of his parents and other close relatives. In this connection information will be collected on the child's level of knowledge and information.

At this point it should be obvious that no large-sample research can be conducted in this particular area. The most practical plan calls for an intensive examination of a small number of parents and children. If this thorough investigation yields promising leads, selected materials will be employed on a larger scale.

The University of Tennessee Deprivation Scale is a simple instrument designed to tease out the extent to which the parents themselves are being subjected to environmental deprivation. It is a reasonable expectation that excessive deprivation for the parents will have direct repercussions on the child. At the same time, parental deprivation is the setting in which the child develops and it provides a direct index of a portion of the child's environmental deprivation. The University of Tennessee Deprivation Scale is a 16-item measure that is described in

detail elsewhere (Thoroughman, et al, 1964). It has been shown to be highly sensitive to such nuances as discrimination of intractible ulcer patients that respond favorably to surgical intervention as contrasted with those who do not.

The fourth measure is a fairly standard index of SES based primarily on father's occupation and income, characteristics of the residence and the like. Supplementary information on vocation and income for mother and other relatives will, of course, be considered where they apply.

Since parents and other persons in the child's immediate environment are major determinants of current as well as long-range behavior, it behooves investigators to give them careful research scrutiny.

2. LEARNING: CONDITIONING, DISCRIMINATION LEARNING, CONCEPT FORMATION, PROBLEM SOLVING AND MEMORY

Barbara A. Frengel

The concept of learning is generally accepted in psychology and numerous theoretical formulations can be found that center around it. Learning has been defined in two generally different ways (Hilgard & Marquis, 1961). The first is the factual definition and describes learning as a relatively permanent change in behavior that occurs as a result of practice. Learning, factually defined, has the status of an intervening variable linking the two objectively defined variables-behavior change and practice. The second is the theoretical definition. Theoretical definitions of learning usually provide hypotheses regarding the "true" nature of learning or propose conditions necessary for learning to occur.

Controversy concerning the nature of learning and its determinants has led to an array of investigational areas that can be subsumed under this topic. Consequently, sets of elaborate experimental procedures have evolved. Within these areas the general term, learning, is usually abandoned in favor of such terminology as discrimination learning or concept formation. These new labels are associated with rather specific experimental procedures and are seen as providing more adequate descriptions of what goes on. Along with these definitions seems to have evolved a notion that each of these experimental procedures effects a new form of learning. Whether or not the various forms of learning are basically different, i.e., are governed by different sets of laws, remains an empirical question.

What is important to us here is that they all have implications for the assessment of learning.

The order of complexity of the various forms of learning seems to be as follows: Conditioning, discrimination learning, concept formation, problem solving and creativity. This progression is arbitrary, however, in the sense that these divisions are not mutually exclusive and often shade into one another.

Returning to our factual definition for a moment, if learning is a relatively permanent change in behavior then its effects should persist in time. Measures of memory or retention are then reflective of learning and provide us with another possibility for assessment.

This section will review the experimental procedures involved in the areas of conditioning, discrimination learning, concept formation, problem solving, creativity, and memory. The implications for the assessment of learning will be our major concern as each area is discussed in turn. Finally, various assessment items will be proposed on the basis of these implications.

CONDITIONING

There is disagreement as to whether all learning obeys the same laws as simple conditioning, but it is generally accepted that conditioning is one of the simplest forms of learning. The conditioning experiment has provided a useful tool for the coordination of many known facts about learning and the prediction of new learning phenomena.

Two major types of conditioning situations have been defined, the classical conditioning experiment based on the work of Pavlov (1849-1936)

and the instrumental conditioning experiment derived from the work of Bekhterev (1857-1927).

Classical Conditioning

In classical conditioning procedures, the unconditioned stimulus (UCS) is a stimulus which initially elicits a response. The conditioned stimulus (CS) is neutral with respect to the unconditioned response (UCR). A training trial consists of a paired CS-UCS presentation. Various types of classical conditioning have been defined in terms of the CS-UCS interval (stimultaneous, trace and delayed) and in terms of the type of UCS used (classical defense or classical reward).

The three major reasons behind the classical conditioning research with children are: To determine whether the organism is conditionable, to provide an index of development, and to search for basic principles of learning.

Work on infant conditioning leads one to the conclusion that the infant is conditionable. Numerous responses have been used in this research and although individual studies are not free of methodological criticism, taken together, the evidence they present is impressive.

Another way that classical conditioning has been used is as a method for determining the maturity of the nervous system or as an index of development of the child. A good example of this approach is the research conducted by Papousek in Praha, Czechoslovakia.

Perhaps the most well known research with pre-school children is that which has been conducted by Razran using the conditioned salivatory response. Cotton balls are weighed and then placed in S's mouth. The

response measure is weight change in the cotton ball.

Classical conditioning procedures can provide useful information about the level of development of the child and the rapidity with which he acquires new responses. This procedure, however, is an extremely sensitive one and requires carefully controlled experimental situations. For this reason it would have dubious value when included in an assessment battery that is designed for field application.

Instrumental Conditioning

Instrumental conditioning differs from classical conditioning in that the reinforcement is contingent upon the S's behavior; the behavior is instrumental in bringing about the reinforcement (at least in instrumental reward conditioning). Three different types of instrumental conditioning have been defined on the basis of the result that the conditioned response effects (instrumental reward, instrumental avoidance or instrumental escape conditioning).

Instrumental Reward Conditioning. In instrumental reward conditioning, S's response results in a pleasant outcome. Three procedures used in instrumental reward conditioning have been distinguished on the basis of how a trial is defined (Spiker, 1960). The first of these is the discrete trial procedure where a trial is defined in terms of the presentation of the CS. A CS is presented and an arbitrary maximum time for responding is set by E. Most of the studies utilizing the discrete trial procedure with pre-school children have involved lever pulling or bar-press responses. It seems that little learning is involved in these studies and the major emphasis here has been the study of motivational

rather than learning effects.

The second procedure is the free operant situation of Skinner. Here S can respond as often as he likes in a given block of time. Skinner talks about this as emitted rather than elicited behavior as E has no control over the CS and can't specify the stimuli involved. Operant conditioning has been done with children using both continuous and intermittent schedules of reinforcement. The primary interests here are the schedules of reinforcement (interval, ratio, fixed or variable) and their effects on the shaping and extinction of behavior. Learning is involved here and the child learns to minimize efforts and maximize rewards.

The third is the controlled operant procedure which is a combination of the free operant and the discrete trial. The CS is specified and the duration of the CS defines the trial. Subjects can respond as often as they care to and the number of responses for a subject on one trial is used as the response measure.

Instrumental Escape and Avoidance Conditioning. In avoidance conditioning, by making the appropriate response S can avoid some sort of noxious stimulation, while in escape conditioning S can escape noxious stimulation after experiencing it by making the appropriate response. An outstanding example of research utilizing elaborate reinforcement schedules in the study of escape and avoidance learning in children is the work of Baer (1960, 1962).

DISCRIMINATION LEARNING

The discrimination learning situation has received a great deal of

attention in child studies. White (1963) feels that there are several reasons for this. First, it is a simple, sensitive, and flexible procedure. More importantly, however, slight changes in the procedure can bring the problem to closely resemble paired-associates, operant multiple schedule, or concept-formation learning situations. This has led to the hope that an understanding of discrimination learning will have implications for other cognitive behaviors.

Types Of Discrimination Learning Procedures

Spiker (1960) has attempted to define and describe the various discrimination learning situations. The labels help to clarify the major differences in these techniques, but the techniques are not distinctly different. The procedures that have apparant utility for our purposes will be discussed here.

Differential Conditioning. This is perhaps the simplest discrimination learning situation. In differential conditioning two stimuli are presented to the child, a conditioned stimulus (CS) and a test stimulus (TS). It is desirable to establish, through training, a conditioned response (CR) to the CS and no response or a lesser response to the TS. With increased similarity between the CS and the TS, differential conditioning is more difficult to establish. This is a useful approach for assessing whether the child can tell given stimuli apart. White has made the point that the child's performance on a discrimination learning task most likely reflects his learning to be guided by specific stimulus differences in the choice of his response and not necessarily the child's ability to detect these differences. On the other hand, if a child can

respond differentially to two stimuli in a differential conditioning situation, it is fairly conclusive evidence that the child can detect these differences.

Spatial Discrimination Learning. In this situation two identical stimuli are presented and the only basis for discrimination is the spatial cue. The spatial cue seems to be a very potent one for children. A controversy that has arisen from this technique is the "Place Versus Response Learning Issue". This controversy stimulated a good deal of research in the late 1940's and although the results of these studies are inconclusive, several points seem to have been established. It seems that if external cues are held to a minimum the response learning interpretation is supported, but with a greater number of external cues, a place analysis is favored. The spatial discrimination problem can be made more difficult by varying the stimuli involved with the stipulation that the spatial cue is the only one that is consistently rewarded.

Simultaneous Discrimination. In the standard simultaneous problem at least two stimuli are presented on each trial. These stimuli can be regarded as stimulus compounds, each consisting of several components (hue, brightness, form, etc.). Of these components, only one is consistently reinforced, the others being equally often reinforced and not reinforced. In essence, what the child must learn in this situation is to selectively respond to one aspect or component of the stimulus situation. In the simultaneous situation a direct comparison between stimuli is possible. In many instances the simultaneous problem has proven to be less difficult than the comparable successive problem (Lip-

sitt, 1961), but specific experimental variables have been shown to influence this result. This may have implications for training rather than testing procedures. Difficulty in the simultaneous problem has been shown to increase with the increased similarity of the cues and with the increased number of components varying within the stimulus setting (trial).

Successive Discrimination. In the typical successive discrimination problem, the stimuli to be discriminated never occur on the same trial. In its simplest form only two cues (A and B) are relevant. One of these (A or B) is presented on each trial and the child must learn to make one kind of response to A and another to B. Successive discrimination is involved in many human behaviors, most important for us is reading. When the child is presented with the stimulus L E A D he must learn to make the response "lead", but when the stimulus R E A D is presented he must make a different response, "read".

Conditional Discrimination. Here the stimuli that are presented are the same between trials. The response that the child makes is acquired by learning to attend to an additional cue, e.g., background hue. If the stimuli are a circle and a square, the circle may always be reinforced when the background color is blue, and the square when the background is red. This is actually an extension of the successive discrimination problem.

The Oddity Problem. In this situation, at least two stimuli are highly similar as regards some dimension that is relevant, and a third is not. Oddity is a relation made in reference to something. This problem can be extended to situations that might more appropriately be termed

concept-formation.

Discrimination Procedures and The Assessment of Preschoolers

What can we learn about the capabilities of the pre-school child through the methods described above? The discrimination situation seems a valuable procedure for answering the following questions.

1. Can the child detect the difference between two stimuli (psychophysical discrimination)? There is little reason to believe that the pre-school child is unable to detect major differences in form, hue, brightness, etc. This is supported through numerous investigations using pre-school children as Ss when one of these dimensions has been used as the basis of a discrimination task and the children were able to respond appropriately. By presenting the child with slight variations in letter-like form, however, it may be possible to determine the child's readiness for some educational experiences such as reading.
2. How rapidly can the child learn to respond differently to stimuli? The ease with which the child learns to respond differentially to similar stimuli may have implications for predicting performance in other comparable situations. This is not the same as psychophysical discrimination. The problem here is how rapidly the child can learn to use the differences he has already shown himself able to detect.

3. What classes is the child able to form? The oddity problem provides a useful tool for exploring the child's ability to define classes. According to Piaget (1965), the composition of relations of equivalence is the same thing as the composition of classes, since a class is a collection of elements that are equivalent from a particular point of view. In the oddity problem choosing the "odd" stimulus implies that the child has been able to define a class in which the two similar objects are included and the odd stimulus is excluded.

Proposed Assessment Items Based on The Discrimination Procedure

On the basis of the three questions formulated above, the following items are proposed. An attempt has been made to order the items according to difficulty.

Along what stimulus dimensions can the child detect basic differences? Two dimensions have been chosen for study; form and hue. The procedure used will be that of differential conditioning. Social reinforcement has been tentatively decided upon as it has been shown effective with children of this age range (Terrell & Kennedy, 1957). Class differences have been found in the effectiveness of various reinforcers, however (Terrell, Durkin, & Wiesley, 1959), which makes the use of social reinforcement a questionable procedure in assessment. Preliminary work with social reinforcement in a task of this nature has been encouraging, however.

The child will be presented with three stimuli varying only on the dimension that is relevant. The administrator will introduce the task as

a "guessing game" where the child must find the picture that the administrator is thinking of. The corrective method will be used.

Problem 1. Form. The child is presented with three forms, circle, square, and triangle. All forms are of the same hue and equivalent size. Position is counter balanced. The triangle is always positive. The task is then repeated with square positive. If the child learns to respond only to triangle, then he can differentiate it from square and circle. If he learns to respond only to square, then he can differentiate it from circle and triangle. Thus, he can also differentiate circle from triangle and square.

Problem 2. Hue. Three circles identical in size are presented to the child. One is red, one yellow, and the third is blue. Yellow is positive. The task is then repeated with blue positive.

In our preliminary work sixteen children from the Open Door Nursery School were given a discrimination problem in which color (red, yellow and blue) and form (circle, square and triangle) varied within settings. Social reinforcement and the corrective method were used. Half of the Ss learned to respond to triangle and half to yellow. The task was terminated when S reached a criterion of six consecutive correct responses (first responses) or after 36 trials. No significant differences were found in the number of trials to criterion for those Ss receiving form and color ($\bar{X}$ for yellow = 17.62, $\bar{X}$ for triangle = 18.38).

Can the child learn to make differential responses on the basis of the differences he has already detected? Problem 3 and 4 follow immediately. Actually, Problem 3 follows immediately after Problem 1 and Problem 4 follows Problem 2. Here the child is presented three boxes which either vary in form (circle, square and triangle: Problem 3) or hue (red, yellow and blue: Problem 4). The administrator asks the child to put the "pictures" back into their own boxes.

Is the child able to form classes based on these three basic forms and colors? The procedure here is the oddity problem. Three stimuli will be presented to the child on each trial. Color and form will vary within and between trials. On each trial two stimuli will be identical as regards form or color. The child will be asked to choose the stimulus that is not like the others. On trial one, for example, square may be the relevant dimension, while on trial two the class of things to which two stimuli belong may be the class of "blue things". This problem can be presented in its most difficult form from the beginning, or we may find it necessary to employ easier examples of the oddity problem, only varying form or color on a given series of trials.

CONCEPT FORMATION

As was hinted earlier, the label, concept formation, has been applied to a wide variety of experimental procedures. Vinacke (1951) feels that the practice of assigning them the common name of concept formation may be a questionable procedure. Spiker (1960) has delineated the characteristics that define the concept formation procedure as follows:

> "...the subject learns to make the same response (motor and/or verbal) to each member of a set of stimuli and

> learns not to make this response to stimuli not belonging to this set ...In addition, a concept is said to be attained only when the subject makes the appropriate response to stimuli he has not previously observed in the experiment."

Spiker distinguishes between concept learning and concept discovery. The term "concept learning" applies to situations where the child exhibits original learning such that he comes to label all x-type things as "x" and does not use "x" to refer to any non-x things. The term "concept discovery" refers to those situations where the child must discover which concept to use as the basis for responding. He discusses four methods that have been used in the study of concept formation. These are: the Paired-Associate method, the Stimulus Sorting Method, the simple discrimination-learning procedure, and the Interview-Questionnaire Method.

Inhelder and Matalon (1960) see concept formation as one of the methods for the study of problem solving in children. They feel that the study of concept formation can be analyzed from two points of view. On the one hand, the development of concepts is seen as closely tied to the acquisition of symbolic function and to the development of the child's judgments. On the other hand, concept formation is seen as a product of both social and intellectual factors, and, as such, necessitates the study of the role of language and the elaboration of mental operations. Within the Piagetian frame of reference, the methods they propose for the study of concept formation are somewhat different than those presented by Spiker. Inhelder and Matalon discuss five methods: (1) the study of word meanings,

(2) language in association with concrete contents, (3) the study of the mechanisms of classification, (4) a genetic analysis of intellectual operations, and (5) an explorative approach to the study of intellectual operations where the child is presented with changes in the physical world and one studies the way in which they are progressively interpreted.

Fowler (1962) in a review of the literature on cognitive learning in infancy and early childhood feels that the pattern of findings from higher order conditioning, stimulus generalization, and transfer of discriminations studies, suggests that concept formation begins during infancy. Wohlwill sees the concept formation work as important in the study of the nature and extent of the generalizing and abstracting powers of children's cognitive development.

Concept Formation and The Assessment of Preschoolers

Reviewing the various lines of reasoning behind the research in concept formation, we can now ask what knowledge we hope to gain about the abilities of the pre-school child through the utilization of this technique. In concept formation studies a variety of stimuli are usually presented and the only way to respond correctly is to learn to make the common response to a group or class of stimuli (Palermo and Lipsitt, 1963). In the preceding discussion of discrimination learning, we concluded with the question, "What classes is the child able to form?" Concept formation, then, seems to entail the ability to abstract a relevant stimulus property from variegated stimulus situations, and to generalize responses to all stimuli possessing this relevant property. Research by Piaget and his co-workers is aimed at identifying the child's knowledge

of concepts as a means of understanding the intellectual operations which they are believed to reflect.

Other investigators are interested in the different ways the child acquires the same concept. Osler and Trautman (1961) conducted a study based on the hypothesis that children of superior intelligence attain concepts through hypothesis testing while children of normal intelligence attain concepts through associations. Increasing the complexity of the stimulus situation (and thus the number of possible hypotheses) was shown to affect the performance of children of superior intelligence more than those of normal intelligence. Several other investigators have suggested that sudden learning is more typical of higher intellectual functioning (Kendler & Kendler, 1959; Osler and Fivel, 1961).

An assessment battery of the desired type should include two types of concept formation items. The first should be aimed at determining the basic concepts that the child possesses at the time of the evaluation. The second type should be designed to reveal the rapidity with which the child acquires new concepts.

Proposed Items Based on Concept Formation Procedures

What basic concepts does the child possess? Three problems have been selected which will hopefully provide an adequate description of the child's working conceptual level at the time of the assessment. The first problem is a combination of a labeling, sorting and recognition of similarities. The second problem deals with relative concepts. Solid objects will be presented to the child and the child will be given brief commands such as "Put this car on top of that block", in order to determine

whether the child can demonstrate a working knowledge of the concept "on top of". The third problem deals with the abstract concepts of form and color.

Problem 1. Problem 1 consists of two parts, an Object Naming and and Object Grouping Task (See Appendix). In the Object Naming Task the Ss are shown small replicas of common household items, animals, vehicles and people. Each object is presented and S must provide the label. If he is unable to name the object E goes on to the next object until the list is exhausted. The child is then asked to "hand" E the objects he was unable to name or named incorrectly. In the Object Grouping Task the same objects are again used and some duplicates are added. The child is now asked to "put together" those things that belong together. Each time E asks why the objects are the same or "how are they the same". When the child has completed grouping the objects E forms the remaining possible groups and asks S why he thinks these objects might "go together".

This problem has been piloted with 11 children from the Open Door Day Care Center. These children range in age from four to six years. The problem needs some refinement but the technique seems to be a successful one. More difficult objects need to be chosen for the Object Naming Task as the majority of the items presently used are successfully named by each child. The sorting categories that the children have formed and the order in which they form them are presently being tabulated. One thing that should be noted is that although the children are able to form many of the possible groups they are rarely able to verbalize the basis of the categorization either in their own or in the E's groupings.

Problem 2. This problem has two levels of difficulty. Initially Ss are tested for their understanding of basic height, weight, and size concepts using a discrimination technique. Objects are presented to S two at a time and he is asked to point to "the big one", "the long one", "the high one", "the heavy one", etc. A deeper understanding of these and other relational concepts is then assessed by providing the child with various stimuli and giving him various sets of directions. Execution of the required response is assumed to imply understanding of the concept. (See Appenidx).

Problem 3. This problem also has varying levels of difficulty. Initially S will be presented with two identical objects. He will then be shown a set of objects of a different color (the same color but different than the two he has been given). These objects will vary in form. Only one object will have the same form as the two he has been given. He will be asked to find the thing that belongs in his pile. A similar procedure will be used for color. Following this S will be asked to select items that belong in his pile from a set of objects that vary in color and form; then color, form and size. The Ss will then be asked to find objects that belong in their pile when the set consists of common objects when only the form, color or size is the same as the two he has been given. The final level of difficulty will consist of presenting S with an object and asking him "What shape is this?" or "What color is this?" (See Appendix).

How rapidly does the child acquire new concepts? In this section a technique similar to that of Osler and Trautman will be used. The con-

cept that will be assessed has not been chosen. It would be advantageous to use the same problem that Osler and Trautman describe, but the concept of "two" appears to be too difficult for pre-school Ss. A similar but less difficult concept is needed for our purposes.

PROBLEM SOLVING

In the literature, research on problem solving can be found under headings ranging from complex discrimination to thinking. Munn (1954) asserts that every learning situation presents a problem of one sort or another. The dimensions of problem solving behavior have not been adequately worked out and, consequently, the methods, procedures, approaches, and techniques vary almost as widely as the problems used (Bijou and Baer, 1960). Why, then, should problem solving be included in this assessment battery? What can we hope to gain by this addition? In many ways, the problem solving situation is the logical extension of the concept formation procedure. For our purposes, the problem solving situation will be limited to those situations designed to reflect logical reasoning ability.

Six types of items have been chosen for inclusion under this heading. These are; ordering by size, short term sequences, cause and effect sequences, reasoning by association, reasoning by inference, and alternation. The majority of these problems have been taken from Let's Look at First Graders, a manual published by ETS for the Board of Education of New York.

Ordering By Size. The child will be presented with a building and stacking tower. First he will be asked to built the biggest tower

he can with the stacking blocks. After this has been accomplished, he will be asked to put them all away. The Stutsman Nested Cubes from the Merrill-Palmer Pre-School Tests will be used here.

Short Term Sequences. Sets A, B, and C of the Sequence Cards provided by ETS will be used here. Set A represents an apple being gradually eaten until only the core remains, Set B shows a leaf falling from a tree to the ground, and Set C is a glass gradually filling with tap water. Each set contains four cards. The child will be given the cards and asked to make them "tell a story".

Cause and Effect. Three sets of cards from the Sequence Cards published by ETS will serve as stimulus materials. Set H shows a boy's bubble gum growing gradually larger until it bursts. In Set I, a batted ball results in a broken window, and in Set J, a boy sells newspapers earning more and more money to buy a toy.

Reasoning by Association. The materials used here are similarity problems from the WISC. These items are of the form, "How are _____ and _____ alike?"

Reasoning by Inference. Two types of items will be used here. The first is a rhyme where the child must anticipate the word omitted. Objects will be on the table in front of the child from which he can choose. Prior to the test, the examiner will make certain the child knows the name of all of the items. Examples of this type are:

"Little dogs are puppies,
Little cats are kittens.
Moms and dads wear gloves,
But boys and girls wear (mittens)."

"Johnny is playing with his truck

And Mary with her doll.

Tommy is looking for his bat

So he can hit his (ball)."

The second problem will consist of supplying boys with a truck and girls with a carriage smaller than E's. The child will be asked to push the vehicle through a door too small for the truck or carriage to go through. S will then be asked if E's vehicle will go through. A larger door will then be provided so that E can push his vehicle through. The child will be asked if their truck of carriage will go through.

Alternation. The Hunter-Pascal Concept Formation Test will be used here. This task consists of six problems in increasing order of difficulty:

Immediate reaction

Delayed reaction(Short)

Delayed reaction (Long)

Delayed reaction (Single alternation cue)

Single alternation

Double alternation

CREATIVITY

In a recent article entitled "Creativity" - A Blind Man's Report on the Elephant, Yamamoto (1965) discusses the present state of affairs in creativity research. He points out that most researchers in the area agree that definitional and criterial problems need resolving, that theoretical formulation is desirable, that refinement of measuring techniques and instruments is necessary, and that coordinated research efforts are

essential. "But, alas", he adds, "that about exhausts our happy agreement on the elephant".

There is an abundance of empirical data readily available that reflects the heterogeneity existing among and within the various approaches to this subject. According to Yamamoto (1964) most of the present instruments for measurement of creative thinking are based upon a factor analytic model of human intellect (Guilford, 1959). He feels that a major problem in the validation of such instruments lies in the difficulty involved in finding a criterion that is not contaminated by other human traits, expecially intelligence.

Wallach and Kogan (1965) consider the question of dimensionality within the creativity domain. The authors compare the relative strengths of relationships between creativity and intelligence measures on the one hand, and among the creativity measures themselves, on the other. A large number of the most prominent instruments for measuring creativity (Getzels-Jackson, Cline-Richards-Needham, Cline-Richards-Abe, Flesher, Torrance, and Guilford) are examined with this question in mind. Wallach and Kogan conclude that the measures that have been construed as indicators of creativity are not indicators of some single psychological dimension parallel to and distinct from the dimension of general intelligence. They question whether the measurement approach taken to the creativity domain is necessarily the correct one.

Even greater problems arise when one begins a search for instruments for the assessment of creativity in pre-school children. Few investigators have concerned themselves with creativity measurement below the

elementary school level. There are numerous reasons for this: Pre-school populations don't come in neat little packages of 20 or 30 children, and, in general, are not as accessible for study, paper and pencil tests are impossible at this level, gaining the cooperation of the child is more difficult, etc. Moreover, the majority of the items appearing on the most popular of the current run of measures are not suitable for children under five. Thus, we begin in a void. There is no measuring instrument in existence at the present time that provides normative data, has shown minimal validity and reliability, and is suitable for children under five. The future seems a little brighter, however. Dr. Esin Kaya of New York University reports that the lower limit of her Solving Puzzles Test is the third grade, but one of her students is presently in the process of adapting her measure for use with younger children. Dr. Kaoru Yamamoto has informed me that Form NVA (nonverbal) of the Minnesota Tests of Creative Thinking and Writing has been used successfully with some kindergartners, and Dr. William Ward of Stanford University has derived some pictorial and conceptual procedures for creativity measurement from the Wallach and Kogan procedures.

One investigator who has devoted a good deal of energy to the study of creativity in the pre-school child is Dr. Elizabeth Starkweather. Most of Starkweather's work is involved with the isolation of factors related to conformity behavior, and the design of instruments capable of discriminating between conformists and nonconformists. She postulates that nonconformity is a motivational characteristic of the creative person (Starkweather, 1964), and states, "the creative person is willing to be

a nonconformist, but he is not a compulsive nonconformist."

If one is willing to accept Starkweather's basic assumption concerning the relationship between creativity and nonconformity, then a possible set of measures designed for use with pre-schoolers is available. Yamamoto (1965), however, in a study of creative thinking abilities and peer conformity in a modified Asch situation, found no significant differences in the conforming behavior of high and low creative children as measured by the Minnesota Tests of Creative Thinking and Writing.

Reviewing the research in this area, one is left with a single conclusion: Some standardized procedure built around a clearly defined concept of creativity is sorely needed for the study of creativity of young children. The second portion of this paper will be devoted to this endeavor.

A Working Definition of Creativity

The conception of creativity that is advanced in this paper is an associative one, similar to that proposed by Wallach and Kogan. Items to be included in the measuring instrument will be selected on the basis of two assumptions:

1. The number and variety of responses which the individual can appropriately bring to bear on the same stimulus situation is a function of the creativity of the individual.
2. The number and variety of stimulus situations to which the individual can appropriately apply the same response is a function of the creativity of the individual.

In short, an individual is creative to the degree that he can make appro-

priate use of his environment and his own behavioral repertoire. Three response measures are implied by this definition of creativity: fluency- the number of associations that the child forms, flexibility- the variation that exists among these associations, and adequacy- the appropriateness of the association that he forms.

As Wallach and Kogan have pointed out, it is important to note that one factor contributing to performance is the upper limit of the individual's own behavioral reportoire. From this, one would expect a degree of correspondence between creativity and intelligence measures.

A second thing worth noting is the stress given to the appropriateness of the association. Ward with his work on kindergarten children found that children of this age give many bizarre responses, sometimes naming inappropriate items in the testing room, and sometimes perseverating, giving responses appropriate to previous items.[1]

Prospective Items

1. What kinds of things make a noise? This item has been piloted with a limited sample of four-year-olds (five of them) and has proven very effective. The instructions begin:

> "Let's play a guessing game. I'll make a noise and see if you can guess what I am? Ding-Dong! That's right I'm a bell. Now you make a noise and I'll guess what you are. (At this point S usually replies with, "Ding-Dong!") Good. I think you're a bell too. Now I'll try again. Arf! Arf! Good! Now you try to think of something new that makes a noise and I'll guess what you are.

The examiner is careful to switch categories so that all the examples are not noises made by animals, etc. Then the examiner asks, "What other

1. Personal Communication

things make a noise?"

2. How many different noises can you make with this stick? The examiner takes a wooden hammer (the type used in playing a toy xylophone) and strikes it on the table top producing a sound. The stick is then given to the child and he is asked, "How many different noises can you make with this stick?"

3. Uses. The purpose of this item is to see how many responses a child can make to an unfamiliar stimulus. For this reason, an abstract form of some sort is desirable. The examiner says, "A friend of mine gave this to me as a present. What do you think I can use it for?"

4. What am I doing? Here's another game-like item that can be interspersed between items that might appear more foreboding to the child. The examiner claps his hands and asks S what he thinks the examiner is doing. The examiner tells him that his is a good answer, but explains that he could also be trying to frighten a dog that is about to step on his flowers, trying to catch a fly, trying to clap to a song, etc. The examiner then flexes his arm and gives two yanking movements (as though he were pulling the steam-whistle on a train) and S is asked to guess what he is doing.

5. How can you change this toy dog to make him more fun to play with? A medium-sized toy of one solid color is presented to the child. The child is told that this poor dog feels so sad because no-one ever plays with him. Ths child is encouraged to help the examiner think of ways to change the dog to make him more fun to play with.

6. Let's pretend. The child is asked to pretend that he found a

magic ring that gave him one wish. That wish was to have a day where he was king and could do anything he wanted to. The child is asked what he would like to do if he found this ring.

7. Thank you. The child is told that when someone does something for us that is very nice and makes us happy we say "Thank you". What are some of the things people do for you that make you want to say thank you?

8. Help me. The examiner performs the common finger-play "In a cottage by the wood".

> In a cottage by the wood
> Little old man by the window stood
> Saw a rabbit hopping by
> Knocking at his door.
>
> "Help me! Help me, sir!" he said.
> "Or the farmer shoots me dead."
> "Come little rabbit, come with me,
> Happy we will always be."

The child is asked to remember how the rabbit asked the old man to help him because he was frightened. The examiner then asks the S when someone might ask for help other than in this frightening situation.

9. Extra-Dimensional Shift. The extra-dimensional shift problem is one in which stimuli vary along at least two dimensions and the dimension that is relevant changes with successive problems. Thus, a child that first learns to respond to a given form on a discrimination task may now have to shift his attention to the color dimension for the second problem. This item is aimed at assessing the child's flexibility of thought. Children will be asked to "guess which one" the experimenter is thinking of when a card with varying forms and colors is presented. This has been conducted with 16 children from the Open Door Nursery School; half initially

trained on triangle and switched to yellow, the other half trained on yellow and then switched to triangle. No differences were found in initial learning of triangle versus yellow, and no differences were found in performance on the second task between groups. Within groups, however, a greater number of trials was necessary to reach criterion on the second task showing that switching dimensions is not easy for children of this age.

MEMORY

Two types of memory situations have been described (Palermo & Lipsitt). In the first the discriminative cues are present in the stimulus situation and the child must "remember" what response to make to the respective cues. In the second situation the discriminatory cues are no longer "out there" in the stimulus situation but are seen as residing within the subject as "memories". It is the latter situation that is of interest to us here.

Still another distinction has been made with regard to memory. The memory situation can be viewed as one of recent (short-term) or stable (long-term) memory. Konorski (1961) feels that a large part of human behavior is based upon transient memory traces and that evidence indicates that different mechanisms are involved in stable and transient memory.

Most testing situations, because of time considerations, have dealt solely with recent memory (i.e., digit span on the Stanford-Binet Scales). A popular experimental procedure for the study of recent memory has been the delayed response test. Konorski feels that this test concerns a particular kind of recent memory-memory for directions in space. He has

devised the following test which he feels to be free of this criticism. A set of stimuli of interest is chosen. Whenever the same stimulus is presented twice (SxSx), it is reinforced, while a compound composed of two different stimuli (SxSy) is not (or vice versa). A delay is initiated between the presentation of the first and second component of the stimulus compound so S must "remember" what was presented first and take that into consideration in making his response.

Fowler, in his review of cognitive learning, cites a longitudinal study on verbal memory (Burtt, 1941). Burtt read Greek drama to his son from the age of 15 months to three years. At the age of 8.5, highly significant differences appeared in the case of learning previously exposed passages as opposed to novel ones. On the basis of this and short-term memory studies, Fowler concludes that it would be desirable to begin verbal stimulation at an early age.

Memory and The Assessment of Learning

We now raise the question, "Why include memory on an assessment battery?" This is an easy decision to defend. First, as was stated earlier, the definition of learning as a relatively permanent change in behavior has the direct implication that the effects of learning should persist in time. Thus memory is one way to insure that learning has occurred. Secondly, it seems intuitively logical that a child who has a greater ability to remember what he has learned will end up with a larger store of past experience to work with. Finally, Thurstone (1938) in a factor analytic study of 56 tests found what he termed six Primary Mental Abilities. One of these was memory. In addition, although Konorski dis-

tinguishes between recent and long-term memory he feels that the two processes are related. Thus, information concerning recent memory may have implications for long-term memory.

Proposed Items for The Assessment of Memory

Memory items occur regularly on the Stanford-Binet Scale. These put in their initial appearance at the third year level in the form of Picture Memories. Here the child is shown a picture of an animal and then the picture is removed. The child is now asked to find the same animal on a new card where other animals are also shown. Farm Lotto cards are an excellent source for additional items of this same sort. For greater generality other Lotto categories could be used in addition to animal pictures. Abstract forms could be substituted for pictures by presenting one of the forms from the Coordination Board and then asking S to find it when the complete board is presented.

The second memory item on the Binet appears at the four year level. This time S is asked to name various objects from memory. Sets of three objects are presented and each time S is asked to "shut your eyes" as E removes one of the objects. This is a suitable item for the age ranges which we wish to encompass. At the four year level the Binet Scale includes an additional memory item, Memory for Sentences, to be used as an alternate. The sentence is read to S and he is asked to repeat it. This idea could be scaled down and used with children as young as two years. Initial items could consist of simple subject-verb sentences with adjectives and adverbs gradually added until more complex sentences are constructed.

A fourth item-type that appears on the Binet and has apparant usefulness for this battery is the Copying a Bead Chain item that appears at the eight-and-one-half year level. This item is much too difficult for the four-year-old child but could easily be scaled down. Starting with chains as small as two beads in length, a greater number and variety of beads could be added until the child is no longer able to reproduce the design. A terminal level could then be established.

Other possibilities for memory items include delayed response tasks, where longer and longer delays can be initiated or where the number of objects to be remembered is increased with succeeding problems, and items of the Konorski same-stimulus versus different-stimuli type. Examples of these problems appear in the Appendix.

3. SENSORI- AND PERCEPTUAL- MOTOR ACTIVITY — W.O. Jenkins

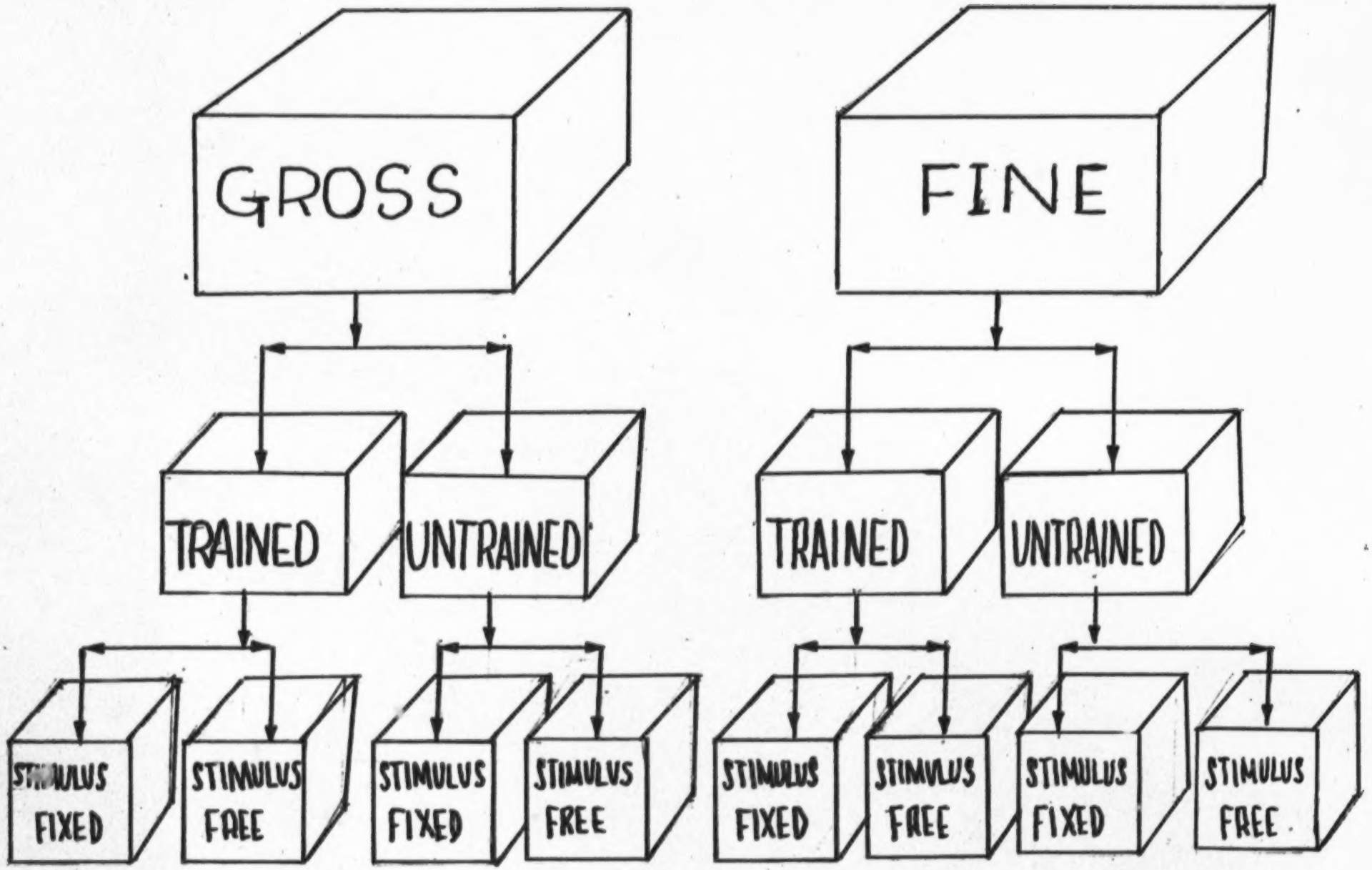
This area is the core one in all training and assessment research. Not denying the class of behavior known as "not responding", behavior is obviously founded on movement - of the body, appendages, eyes, mouth, etc. A careful look needs to be taken at this sphere of child activity. This measurement field included in some part behaviors classified as sensori- and perceptual- motor.

As in many instances of behavioral classification, there are many different ways of cutting and slicing Motor Activity. One follows that has proved useful in the present context. There are three basic dimensions to movement: 1) gross-fine, 2) trained-untrained (or skilled- unskilled) and 3) degree of stimulus fixation or freedom. These are represented in their eight combinations in the accompanying figure.

The gross-fine distinction is an obvious and commonly used one. The former movements refer to body or trunk activities such as running or jumping. Fine movements are motions of a limb or head or a portion thereof such as nodding, or shoulder shrugging, ear wiggling or finger tapping. The trained-untrained dimension should be clear. Dancing and baseball playing are examples of trained, gross bodily movements while walking and running are cases of untrained activities. Typing is an example of a fine, trained skill. Brown and the writer (1947) have, among others, presented an experimental program for the analysis of motor abilities involved in equipment design, i.e., certain kinds of skilled or trained movements.

The stimulus-fixed or -free dimension is the least clear. It simply means the extent to which the movement is stimulus-bound, or

SMF



A SCHEMATIC BREAKDOWN OF BODY MOVEMENT WITH THE THREE MAJOR DIMENSIONS REPRESENTED

contingent on certain cue conditions. Simply throwing a baseball is one thing, throwing it to second base is another. Solo dancing is a kind of operant behavior while dancing with a partner is stimulus-tied. In learning theory terms, stimulus-free behavior is operant while stimulus-fixed reactions are respondent. It is basically a question of ease of stimulus identification. This classification organizes and encompasses a number of behaviors for research purposes. Included are skilled athletic and artistic actions; everyday activities such as smoking, eating, writing, leg-crossing and undressing; and special behavioral features such as tics, scratching, stammers and finger-nail biting. All these specific response classes are, of course, measured precisely in terms of frequency, latency and the other basic measures commented on previously.

In passing, it might be noted that there is nothing special about verbal behavior in this context. It is another class of fine movement amenable to the same kind of treatment as walking or drinking and is recorded in basic measurement terms. The fact that language can be approached and analysed in many different ways does not make it unique. Assessment of it still reduces to the basic measurement terms of frequency, latency, loudness and the like.

With this analytical background behind us, we can now turn to the specific measures recommended for use in assessing Motor Activity. A number of tests are available in the literature, many of which have been developed in a physical education setting. These are primarily indices of gross movement via muscular skill and coordination (running, jumping, and throwing) which are of little direct applicability in the present

context. Among these may be mentioned the Brace Test (Brace, 1927), employed on a large scale by Espenschade (1947, 1963) in studying development of motor coordination by age and sex. A similar series of measures have been produced by Ismail and associates (1963, 1964) who contributed a factor analysis of motor measures along with I.Q. and academic achievement. Results of related studies in the motor area are summarized in recent publications by Bucher (1965), and Kephart (1960). Of passing interest is a moderate positive relationship between physical ability and academic potential and achievement, supporting classical findings in this regard. More directly pertinent is the work of Berger (1965) who has developed tests and training procedures taking off from the work of such investigators as Kephart. In the Gross Body Movement section that follows, we have leaned heavily on Berger's material.

Gross Body Movement

Here we are interested in the child's ability to either follow verbal directions or imitate the movements made by the Examiner. As in other instances, we are interested in the limits of the individual child and in deviant or unusual behaviors.

1. Walk. The child is requested to walk forward, backward, sideward, rapidly, slowly, to take one step back, to walk and stop, to walk to selected objects in the room, to follow a given path, to walk with eyes shut, to walk on a walking board, etc. etc. The basic, tentative scoring will be all - or - none: the child follows directions (or imitates) or does not. Intermediate degrees of scoring on a four-point scale will also be used in terms of smoothness, accuracy, and speed of

the movements. In addition to these second-order ratings, primary measures will be recorded in terms of time and spatial duration from 100% accuracy.

2. Other Locomotion. The same kind of procedure will be applied to such gross activities as jumping, skipping, running, crawling, hopping, and hop scotch. The child will be requested, for instance to "hop in place" with his eyes both open and closed. To assess tempo and rhythm he will be requested to walk or skip in time to a stimulus such as a metronome. The same scoring procedures will be employed.

3. Position Reactions. Here the child will be asked to stand motionless, make a half turn, a complete turn and face various objects in the room. He will be further requested to lie down on his back and stomach and roll over from these positions. Sitting, kneeling and standing will be assessed in terms of postural description.

4. Balance. Assessment of gross sensori-motor coordination will utilize a Tilt or Balance Board along the lines of a "Teeter-Totter". Performance will be measured with eyes open and shut. Duration of reacting and frequency of deviation will be recorded.

5. Operant Movement. While the child is maneuvering in the testing room, descriptions of motor activity will be recorded. Similarly such records will be kept of "free play". Measures will be in terms of nature of the activities, frequency, intensity (resistance to distraction), rate and so forth. The observations will apply to Fine Movements as well as Gross and will include parametric matters such as individual vs group play.

Fine Movement

As in the case of Gross Movement, verbal directions will be presented, imitative stimuli given and specific tasks presented.

1. Identification of Body Parts. In this instance, S is requested to point to and touch ("Put your finger on...") specified body parts including head, shoulder, stomach, neck, mouth, eye, ear, back, knee, elbow, etc. This task is performed both with eyes open and eyes closed.

2. Limb Movement. S is asked to move his arm or hand in various directions: up, down, in front of his body, in back, out to the side, make a circle with his arms, put his fingers together - again with open and closed eyes. An indication of laterality can be obtained here. It might be noted at this juncture that these tasks involve information and following directions as well as Fine Movement. Assessment will be applied to all appropriate areas.

3. Pegboard Finger Dexterity. Some instrument will be employed, such as the Purdue Pegboard Technique, measuring this form of eye-hand coordination. This test scores the number of pegs placed with either or both hands in 30 seconds. It is important that the instrument involves large pegs with appreciable figure-ground contrast for the age level involved.

4. Common Finger and Limb Dexterity. The child will be requested to perform dexterous tasks involving fingers and limbs such as lacing shoes, buttoning buttons, putting jacket on, replacing jar lids, drawing lines, etc.

5. Target Accuracy. A measure of agility and accuracy in throwing will be employed, either dart-throwing or casting a beanbag at bullseye on a target.

6. Tracking. Forms will be set up for the child to traverse a path between lines with a stylus or crayon. Number of contacts with the boundaries will be recorded. A series of paths of decreasing widths will be employed.

7. Pursuit. As another index of hand-eye coordination in Fine Movement, it is planned to have S tract a target moving at different rates. Several standard instruments are available for use. Frequency and Duration of "on" and "off" target will be recorded at the differing rates of presentation.

8. Puzzles. Fine Movement measurements frequently involve a strong "perceptual" component which shows up particularly in tasks such as jigsaw puzzle solving. There are available age-scaled puzzles that will be assessed in terms of accuracy and speed of solution.

9. Reaction Time. A thorough examination will be made of this traditional Fine Movement measure which has a good deal to do with the emphasis on "impulsivity" in the recent child literature. Latency measures will be recorded in all settings since speed of response is an integral part of behavior. Included here will be problem solving, language and word association, presentation of novel, unfamiliar stimuli, reactions to frustration and blocking and the like. RT measurements will be taken in response to simple and complex stimuli and in learning and discrimination settings, via such devices as the Marietta Serial Display and Response Apparatus.

10. Figure and Shape Construction and Reproduction. Here it is planned to get at another aspect of eye-hand coordination along with

experience in drawing or sketching. The child will be asked to reproduce simple forms such as lines, more complex ones such as triangles and diamonds along with intermediate degrees of shape difficulty. In addition he will be requested to construct or reconstruct figures of people and common objects. This procedure will be tried with pencil and paper and with match sticks. In addition, blocks and other construction materials will be employed.

4. LANGUAGE - VERBAL BEHAVIOR

Stephen Zeigfinger

It is practically impossible to discuss language *in vacuo*; that is, without relating its development to and its impact on, concept formation, problem solving, learning and discrimination. The separation becomes more difficult in light of experimental evidence that indicates linguistic ability clearly influences a variety of other cognitive functions or skills (Goss, 1961; Zeigfinger, 1964). Although recognizing the implausibility of this divorce, I will nevertheless discuss language in one section and speak of the relationship between language and other cognitive processes under a different rubric.

My particular theoretical and experimental bias tends toward simplicity and objectivity. Therefore, at the outset of our endeavor, I would like to emphasize quantification, recognizing of course, that modification is almost inevitable. That is, content analysis might be undertaken either as another project or as part of the present analysis. My primary concern at this point is collecting raw data and applying feasible measuring techniques. The ten basic measure outlined by Dr. Jenkins will therefore be adhered to as much as possible.

The purpose of this paper is to outline the dimensions of verbal behavior that we are interested in assessing. We realize that many aspects of verbal behavior are excluded from the present review but the nature of our research necessitates these selective, pre-planned omissions. The rationale for each category of verbal behavior chosen for study will be discussed and its relevance to historically significant, contemporary,

and/or projected research will also be explicated.

Perhaps it would be efficacious if we specified those domains of verbal behavior with which we are not presently concerned. Because we are primarily interested in the four to five-year-old, the acquisition of verbal behavior will not be examined in the present paper. We do, of course, realize the significance of the theories that have been advanced to account for linguistic ontogenesis, both in terms of defining the universe of discourse and in terms of stimulating empirical research. The training aspects of verbal behavior will also be neglected. That is, although the shaping of proper pronunciation and the rudiments of grammar are indeed important they are not within the scope of interest of the present paper.

The title of this paper was deliberately chosen in order to limit our realm of discussion. There have been a good many definitions of language offered by psychologists, anthropologists, sociologists, linguists, and a combination of them, but for the present we are confining ourselves to those aspects of spoken language which have an immediate effect on related skills, i.e., thinking and problem solving, and which will have an influence on the functioning of other, later developed facilities, i.e., communication effectiveness.

Major emphasis is placed upon the methods used to elicit verbal behavior. Here we are concerned with determining the best ways to set the stage for verbal output.

A Perspective of The Literature

An examination of the verbal behavior and language literature

reveals that this particular realm of study closely parallels the development of methodological techniques in psychology, particularly in child psychology. The early child study movement was characterized by observational analysis primarily in the form of baby bibliographies. Because linguistic development could be investigated without experimenter intervention and did not require elaborate recording devices, it was studied intensively. Although an abundance of data was accumulated and this information provoked further research by providing many interesting ideas, it had little scientific merit. The methods employed to gather the information invariably differed as did the conditions in which the data were gathered. In addition, much of the information was obtained through the retrospective reports of the parents. This particular method is not attractive to those who are concerned with gathering untainted data (Zeigfinger, 1964).

Psychology was primarily concerned with obtaining normative data in the 1930's and early 40's. The study of verbal behavior was strongly influenced by this methodological bias. The typical studies refer to individual differences in vocabulary (Gansl, 1939; Jersild & Ritzman, 1938; McCarthy, 1930; Templin, 1937), the maturity of statements (Anastasi, 1952), mean sentence length (Fisher, 1934), the total number of words uttered in a given amount of time (Jersild, 1930; Young, 1941) and grammatical structure (McCarthy, 1930; Smith, 1955). Any quantitative measures we obtain can be compared with this abundance of normative data.

This approach to the study of verbal behavior is fraught with problems. An example is readily found in the research on vocabulary. There

is great difficulty in establishing a meaningful conceptual and operational definition for knowledge of a word. How do we determine whether or not a child knows a word? What is our measure? Is it better to use the method of recall or recognition? When we assess vocabulary are we running the risk of underestimating the child's vocabulary? This is easily accomplished by simply asking the child to speak about a topic that is unfamiliar to him. Fowler (1962) warns that if we restrict the number of categories of experience of the child we really cannot make any meaningful statements about the nature of his vocabulary. A recent normative study conducted by Templin (1957) has taken most of these problems into account.

Since the 1940's two major trends have developed in the study of verbal behavior. The first concerns the vocalizations of infants and involves phonetic analysis and sometimes elaborate recording devices. The second deals with deviations from normal linguistic development. These studies are found in the clinical literature and focus upon the dynamics of language disorders and their relationship to the total personality. LeBrant (1933) and Goldstein's (1948) research are examples of this approach. A detailed review of these approaches is not within the scope of this paper but the interested reader can find an excellent analysis and an extensive bibliography in McGraw (1956).

THE PRESENT RESEARCH

Our first major problem is a methodological one: Determining ways of eliciting verbal behavior. We have to consider the possibility of experimenter interference, particularly in reference to directing the children's output. We also must attempt as best we can to get operant

verbal behavior, that is, spontaneous output with minimal external probing. As I see it, this is an experimental or perhaps, better, an exploratory matter. This aspect probably will have to be played by ear, at least in the initial phase of the project.

POSSIBLE ELICITATION METHODS

1. The Institute for Developmental Studies (IDS) has used a telephone technique with pre-schoolers and they report that it is a very successful method. Its simplicity is one of its more attractive features. Two children are seated several feet apart with a screen separating them. Each has a telephone and they are instructed to converse. The choice of an appropriate topic might be a problem at first. As an added dimension, we might leave the choice of the topic up to the children. Conversation is recorded and measurement is uncomplicated.

2. Children are encouraged to describe the activity or game in which they want to be engaged. The IDS reports "A gradual transition from a monosyllabic, low-voiced description to a more complex and polysyllabic one". They claim that "this model of associating verbal description with more motoric and sensory activities allows us to build on the earlier developed skills already possessed by the child".

3. Another successful technique reported by the IDS is having children retell stories after the teacher reads one to an individual child. It is necessary to find appropriate stories with this method. We could get at distortions, elaborations, sentence structure, sentence length, etc. using this method.

4. As mentioned before, an attempt should be made to get "pure"

operant levels. One possibility would be to replicate a procedure used in a recent investigation (Zeigfinger, 1965). The experimenter led each child into an ordinary school office. The child was instructed to sit on a chair. The only other person in the room was an adult female observer who was present for all children at all times during the study. The child was not introduced to the observer. After sitting down, E told the child that it would take a few minutes before he was ready for him. E then left the room.

It should be noted that both E and O behaved in a friendly manner so that the child was not unduly upset. That is, the situation was contrived in such a way as to reduce, or at least keep to a minimum, the anxiety which is normally generated by such an experimental procedure.

The observer remained quiet for 30 seconds and then, if S had not yet initiated conversation, said, "Hi, my name is Sherry. What's your name?" If S responded with just a name and nothing more, O allowed another period of 30 seconds to elapse, then said, while holding a packet in her hand, "Would you like a candy?" If S responded merely with "yes" or "no" O again remained silent for 30 seconds, then said, "Would you like to tell me something about yourself or about one of your friends?" The question was inverted in half the cases so that the possibility of positioning was counterbalanced. Therefore, the question had this alternative presentation: "Would you like to tell me something about one of your friends or about yourself?" This question terminated the experimental treatment for that S

During conversations with the children O remained as verbally

passive as possible. Verbal passivity, in this particular situation, was defined as answering S's questions using brief, definite, non-ambiguous words such as "no", "yes", "of course", or "certainly". The observer was courteous and refrained from uttering any sentences which might have been construed by S as requiring an answer. For example:

S: "What are you doing here?"

O: "I am waiting for a friend."

Never saying:

"I do not really know, but I wish I did."

All dialogue was taped using a standard portable tape recorder which was concealed from S.

Definition of the Response The first response dimension analyzed was verbal instigation; that is, did S or O initiate conversation? A words/minute ratio and a count of the total number of words uttered was obtained for each S. Other response dimensions were also evaluated, but are not reported in this thesis. They are:

1. Ideas per unit time
2. Verb-adjective quotient
3. Intrusions
4. Pronoun count
5. Egocentric and sociocentric speech patterns

This procedure is readily modifiable. We could have two children in a room, neither one a stooge, and observe their verbal behavior. Or perhaps train a young stooge.

5. The literature dealing with the operant conditioning of verbal

behavior of the human organism has been rapidly expanding over the past few decades (Krasner, 1958; Lenneberg, 1964; Salzinger, 1959; Williams, 1964). There have been, however, relatively few publications concerning the development of instruments to identify and measure this behavior. Recently a very clever technique has been employed by Salzinger et al to elicit operant verbal behavior. A large bounce-up figure that contains a tape recorder system acts as the eliciter. The child is told that he makes the clown's nose light up by talking to him. The light is randomly programmed and is very effective in eliciting verbalization.

Another possibility would be to assess the child's susceptibility to verbal conditioning. Greenspoon (1955, 1962) is probably responsible for the recent surge of interest in the application of reinforcement theory to verbal behavior. He demonstrated that the emission of words within different word classes could be decidedly increased as a function of verbal reinforcement. Mandler and Kaplan (1956), Sidowski (1954) and Wilson and Verplank (1956) using Greenspoon's paradigm as the prototype began reinforcing the same response class, travel words and living thing words. Several investigators have also reported effective verbal conditioning when utilizing non-verbal reinforcers such as light (Sidowski, 1954), a buzzer (Greenspoon, 1951), a bell tone (McNair, 1957) and headnodding or postural shifts (Wiches, 1956). These techniques could be easily adapted for use with young children.

THE ASSESSMENT OF THE RELATIONSHIP BETWEEN VERBAL PERCEPTION, BEHAVIOR, AND THE COGNITIVE PROCESSES

There has been a general acceptance of the proposition that language

plays an important role in determining how an individual views the world. The specific relationships formed between language, culture, and the cognitive processes have yet to be demonstrated. However, there have been several attempts to clarify these bonds (Bernstein, 1959; Force & Force, 1961; John, 1963; Schatzman & Strauss, 1955). Essentially, there are two explanations that are offered in order to clarify the relationship between language, thought, and culture. The first postulates that language reflects the culture of the people who speak it and that the world gets through to the person and demands representation, in one form or another, in any language (Church, 1961). The second set of explanatory principles is best represented by the term linguistic determinism, which states that language is a strait-jacket, that is, the structure of perception and thought is dictated by the structure of the language that one speaks. Whorf (1956) maintains that if the words which are needed to construct a certain concept are not contained in the language that a particular person speaks, then this individual cannot grasp concepts connected with those words. Therefore, because the Eskimo has more and different kinds of words for snow than the non-Eskimo, he can form more higher order concepts concerning snow than the non-Eskimo. Language then, for the linguistic determinist, molds the culture.

The Sapir-Whorf Hypothesis is derived from the following excerpts:

> "Language is a guide to 'social reality'. Though language is not ordinarily thought of as of essential interest to the student of social science, it powerfully conditions all our thinking about social problems and processess. Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much

at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the 'real world' is to a large extent unconsciously built up on the language habits of the group. No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached.

The understanding of a simple poem, for instance, involves not merely an understanding of the single words in their average significance, but a full comprehension of the whole life of the community as it is suggested by their overtones. Even comparatively simple acts of perception are very much more at the mercy of the social patterns called words than we might suppose. If one draws some dozen lines, for instance, of different shapes, one perceives them as divisible into such categories as 'straight','crooked'. 'curved', 'zigzag', because of the classificatory suggestiveness of the lingusitic terms themselves. We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation (Sapir , 1929)."

Whorf (1956) adds:

> "... that the linguistic system (in other words, the grammar of each language) is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade... We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds - and this means largely by the linguistic systems in our minds."

Hoijer (1954) classifies Whorf as a linguistic relativist because of Whorf's notion that "users of markedly different grammars are pointed

by their grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world." This writer prefers to classify Whorf as a determinist because he suggests that perception, independent of a specific language, is shaped by that language.

The empirical data which purports to resolve or at least to clarify the issues raised by the Sapir-Whorf Hypothesis is rather skimpy but nevertheless intriguing. Bernstein (1959) has suggested that the uneducated people in England who use short, grammatically simple sentences, inappropriate verbal forms, and who display a rigid and limited use of adjectives and adverbs cannot conjur up "differentiated cognitive and affective responses". John (1963) investigated the relationship between language style and cognitive development among three social classes of the Negro population. She found that children who were linguistically deficient in terms of sentence construction, vocabulary, verbal forms and general grammar proficiency had a concomittant difficulty with integrating various concepts into their cognitive repertoires. John accepts that language and thought are inextricably bound and her research attempts to "ascertain those patterns of linguistic and cognitive behavior that are characterized by internal consistency and are related to the socio-economic environment of the subjects". She explains the differences which her study has revealed in terms of social communication. Language is relied upon in the small, nuclear middle-class home as an effective means of communication. The young child is stimulated to talk, is reinforced

for naming objects, and is provided with corrective feedback. He has the opportunity to hear simple labels repeated often. The lower-class child, on the other hand, hears words and sees their referents but his attempts at verbalizing then often go unrecognized and his curiosity or motivation is probably thwarted.

Schatzman & Strauss (1955) provide additional data which support the notion that cognitive functioning is at least partially dependent upon linguistic ability. Their findings indicate that lower-class individuals, because of their linguistic handicap, perceive the world in concrete terms and are unable to "see" the other person's point of view.

The recent work of Furth (1964) suggests an attractive alternative to the Sapir-Whorf Hypothesis. Furth has tested the hypothesis that "experience may be a sufficient determinant for the development of intellectual capacities and that deaf adults make up their possible initial experiental deficiency by simply living an adolescent and adult life. "In other words, it may not be necessary to employ a vocal language in order to operate at a 'normal' cognitive level. Language, of course, is important because it may provide the individual with more opportunities to encounter new and varied experiences." Furth compared several groups of deaf and hearing subjects on a simple conservation task. The results indicate that hearing six-year-olds and deaf eight-year-olds performed similarly, but both of these groups performed more poorly than hearing eight-year-olds. Furth offers that "the most natural explanation of the differences observed in performance between deaf and hearing children on the conservation problem would ... appear to be the difference in ex-

perience as well as in formal training with numbers to which the hearing children were exposed... " He hastens to add that"one should be slow in attaching a generalized retardation to poverty in language facility." Furth also points out that Piaget postulated no necessary connection between language and thought. "For Piaget, the advanced stages of logical development have their origins in non-verbal sensory-motor and imitative behavior." The experimentation of Köhler and his associates might also be considered to add weight, if not credibility, to Furth's assertions. Although Furth represents a new approach he is not entirely convincing. This is probably due to the question he asks. It is obvious that cognitive ability is not entirely dependent upon linguistic proficiency nor has anyone, to this writers knowledge, advanced this notion. It seems that Furth has created a straw man but, of course, this writer probably could be the object of a similar accusation.

Regardless of the position that one chooses to take, it would seem absurd to attempt to deny the influence of language on the cognitive processes. Mussen (1963) offers this evaluation:

> "Skill in concept formation is closely linked to the acquisition of language, particularly to labeling. After he has learned the names or labels applied to objects or events, a child is likely to react in the same way to all stimuli having the same labels. This is known as verbal mediation or mediated generalization ... Such mediation is of paramount importance in concept formation, problem solving, thinking and learning (p. 37)."

Goss (1961) also conceives of language as having a mediating role particularly in the acquisition of conceptual schemes. According to Goss the acquisition of these schemes involves three operations:

> "(1) learning modes of representing conceptual schemes; (2) learning names for sets of categories and for categories of such sets, and names for variables and values of variables; and (3) learning to combine the modes of representation with names for sets of categories and variables in particular conceptual schemes.
>
> Conceptual schemes have their value because they involve verbal labeling responses which serve a mediating role; in some instances they provide for transfer from one situation to another, and in other instances they serve the function of discrimination."

Although it is clear that language influences many other skills we cannot possibly assess all of them. Thus far we have decided upon two measures.

1. The Unusual Uses Test first developed by Torrence (1960) and later used by Iscoe and Jones (1964) will be employed in the present project. It is a very simple technique, highly adaptable, and there is an abundance of data avialable. A number of different common objects i.e., table knife, newspaper, alarm clock, cup, etc., are presented separately to Ss. The E asks the S "What is it used for". The S was then requested to give as many other uses for it as he could. No time limits were imposed. Responses are recorded verbatim (tape recorder would be most suitable for our purposes). After responding to the last object presented, subjects also had the opportunity to give additional response to any of the other objects that had been presented.

Scoring

Unusual Uses Test is scored in two ways:

1. Ideational Fluency

   The number of uses given for each is counted and summed

across the four objects.

2. Ideational Flexibility

The responses are classified into functional categories by objects and summed across objects.

The first score, which is readily and reliably obtained, is a commonly used measure of ideational fluency, while the second score (flexibility) is also a quite usual one obtained in testing creative thinking ability. The flexibility score, i.e., the number of different categories of usage, is understandably lower than the fluency score.

2. The second technique is borrowed from John (1963). She developed the following method in order to examine patterns of linguistic and cognitive behavior in a sample of Negro children from various social classes.

LABELING

Labeling is similar to morphological analysis, in linguistic terms. When the child first learns to speak, he masters more or less precise relationships between perceived phenomena and their labels. This acquisition is both a receptive and expressive process. On one hand, the child is exposed to the word and its referent; subsequently, his own labeling actions become overt and these efforts receive social reinforcement.

Measuring of Labeling:

1. The Peabody Picture Vocabulary Test was used to measure receptive vocabulary.

2. The WISC vocabulary was used to measure expressive vocabulary.

3. A "Verbal Identification Test" was used to see how successful

children were in a) enumerating what they saw on stimulus cards depicting simple events or groups of objects; then b) choosing an appropriate "title" for each picture, that is, integrating the various stimulus objects into a coherent assemblage.

Relating: Relating is comparable to syntactical analysis, in linguistic terms. At this level the child learns to chain responses.

Measures of Relating: The Word Association Test, a method of eliciting behavior at the relating level, was utilized to study the patterns of associations children make to stimulus words. Younger children usually give completion responses to stimulus words while older children usually give responses which are in the same form-class, that is, they will respond with a verb if the stimulus word is a verb and with a noun if the stimulus word is a noun.

Classificatory Behavior: This language-conceptual level is not clearly defined but rather refers to a general categorization ability. Whereas labeling can be defined as the relationship between word and object, relating deals with intraverbal relationships. Classificatory behavior involves overt language as well as thinking, a fact which greatly handicaps scientific inquiry into these processes.

Measures of Classification: A Concept Sorting task was designed which allowed children to group 16 cards into functional pairs or into logically consistent piles or categories of four cards each. Each subject was questioned after he had completed the task.

5. ATTENTION AND MOTIVATION

Barbara Frengel

The status of motivation in psychology is not nearly so stable as that of learning. Indeed, the question arises as to whether motivational constructs are needed at all for an adequate theory of behavior. From a utilitarian standpoint, then, the first problem that arises is whether or not a motivational interpretation is a heuristic one. Brown (1961) defines a motivational theory as one containing a unique construct to which a specific label may be attached. In opposition to motivational theories we find associational theories where the consequences usually ascribed to motivational variables are explained be altered associative connections and their interrelations.

In a resume of evidence bearing on motivational interpretations Brown makes five major conclusions: (1) some variables facilitate surprisingly diverse kinds of responses, (2) increasing deprivation from training to testing results in augmented performance, (3) combination of two motivational variables results in more vigorous performance than does either alone, (4) combination of two appetitive variables has produced conflicting evidence, and (5) in a variety of studies a multiplicative relationship between drive and habit strength has been demonstrated. He summarizes the discussion with a statement that, "The principle of parsimony supports exploration of associative interpretations, but no abandonment of drives until they can account for the results more thoroughly."

The second question that arises pertains only to those who have accepted the use of motivational concepts. These theorists have differing

opinions regarding whether or not all behavior is motivated. Young (1961) distinguishes between "narrow" and "broad" motivational theories. Narrow views of motivation restrict the concept of motivation to behavior which is purposive or goal-oriented. Examples of narrow motivational theorists are McDougall (1923), Maier (1949), and Maslow (1954). In the broad view, behavior is seen as a form of physical movement which is causally determined in the sense that it depends upon conditions. This view enables one to study all behavior, reflexive or goal-directed,under the broad heading of determinants.

Another way that the scope of motivational investigations have been restricted is the distinction between the energizing and directing aspects of motivation. The energizing role of motivation is virtually accepted by all motivational theorists. For some theorists (Brown, 1953), however, this is the extent of the motivational effect. Other theorists (Bindra, 1959) give motivational constructs the added attribute of regulating behavior. An issue that arises as a consequence of this additional functioning of motivational variables is the question of single versus multi-drive concepts. Brown postulates only one drive, D. This D is seen as a single state of arousal. McClelland, on the other hand, presents a multi-drive theory. For him drives are defined in terms of the goals that are sought.

Hunt (1960) presents a theory of motivation derived from Lewin's notion of tension reduction. This is similar to Helson's notion of an Adaptation Level, where motivation is defined as a deviation from the Adaptation Level. Theories related to this have been presented by Amsel (1958) and Piaget (1963).

White (1959) feels that there has been a deepening discontent with theories of motivation based on drives. He defines a new concept, competence, which refers to an organisms capacity to interact effectively with its environment. White sees the individual as striving for some state of successful interaction with the environment.

Berlyne (1960) defines a category of behavior, ludic behavior, where the organism is seen as seeking out particular kinds of stimulation, imagery and thought, activities that might be classified as play. These are the instances where perceptual and intellectual activities are engaged in for their own sake, cases where not of the more conspicuous kinds of reward and motivation may be in evidence. Berlyne suggests that ludic behaviors may draw on special sources of motivation peculair to themselves. He characterizes processes placed under the heading of ludic behavior by two processes which they are assumed to have in common. Berlyne states that all ludic behaviors can be described as devices for stimulus selection and can be regarded as ways of reducing conflict.

MOTIVATION AND ASSESSMENT

Combining data from three major research areas: (1) play, manipulatory, exploratory and curiosity behavior research, (2) deprivation studies, and (3) physiological investigations of ARAS functioning, there seems to be ample support to warrant the continued use of motivational concepts in psychological theory. The emphasis of this paper, however, is assessment. There are several reasons why the inclusion of specific test items directed toward the assessment of the child's motivational level is not recommended.

The number of proposed drives is on the increase and the danger exists that "drive" may share the same fate as "instinct" in psychological history. Furthermore, if one adopts a multi-drive notion of motivation, which drives would warrant consideration in our battery? Supposing that separate scales were constructed to provide us with answers to questions like, 'How anxious is the child?', 'What is his curiosity level?', 'How great is his need achievement?', etc., how would we interpret the results? It does not seem that the present state of knowledge warrants such an approach.

Adoption of a general drive notion, on the other hand, has different implications. If one assumes that there are individual differences in drive level such that some children are chronically more motivated than others, then this condition should also exist in our testing situation and should be reflected in other measures on the child. If, however, drive level is assumed to be a function of specific situational variables, then a more fruitful approach would seem to be a systematic search for determinants. This would better be accomplished in an experimental than in an assessment situation.

Advances in this direction have been made by Berlyne who feels that we should stop asking, "What response will S make to this stimulus?", and begin asking, "To which stimulus will S respond?" In his book, Conflict, Arousal and Curiosity, he defines a set of stimulus properties that he feels are related to stimulus selection behaviors. These "collative" properties include novelty, uncertainty, conflict, complexity, surprisingness, and incongruity. Stimuli high in these collative properties are

assume to arouse conflict in S, where conflict is a motivating state.

Cantor (1963) in a recent article reviews the infant and child research on responses to novel and complex stimuli. He concluded that studies dealing with these two properties are, at best, suggestive and that verification that children are attracted to stimuli high on these collative variables needs to be obtained.

The first notion that Berlyne examines in his review of processes contributing to stimulus selection is "attention". He disringuishes between selective and intensive aspects of this process. In an effort to illustrate how the assessment of motivational variables may better be left to experimental research, the remainder of this paper will deal with a proposal aimed at uncovering the stimulus variables associated with attention.

The Effect of Variation of Stimulus Properties on Attention

The purpose of this research is to determine what stimulus properties are effective in eliciting a response and what properties are effective in maintainence of a response when the subject is a child of pre-school age. Six stimulus properties are of interest; size, color, movement, number of distinguishable elements, number of elements responded to as a unit, and symmetry. A line-drawn circle one inch in diameter, centered on a 3x8 inch card will serve as the standard stimulus. Six variations of this standard will be used representing the six stimulus dimensions that are of interest.

The experiment will consist of two parts. The child will initially be presented with all possible combinations of the stimulus cards using

a paired-comparison technique. Following the paired-comparisons task, the same stimuli will be presented in a free viewing situation and the amount of time spent viewing each stimulus will be recorded.

With a design of this type it will be possible to determine what stimulus properties attract the child's attention initially (paired-comparisons ratings) and what stimulus properties maintain attention (viewing time). Furthermore, it will be possible to determine whether the same stimulus properties that are effective in arousing attention are effective in its maintenance.

6. EMOTIONAL BEHAVIOR

Larry Birnbach

Methods for assessing the affective behavior of pre-school children lack the degree of standardization possessed by intelligence tests. They seem to be contingent upon what particular behavior the experimenter is concerned with.

The literature points to four techniques that have met with success in assessing the child's affective behavior patterns; the interview, doll play, projective techniques, and observations. The following sections will deal with some of the pertinent work done in these areas and will include proposals for the direction that our work should follow. The important dimensions of affective behavior seem to be fear, anxiety, love, reactions to stress and frustration, aggression, and attitudes about the self and their relation to significant others in the environment (mother, father, siblings and friends). Through the combination of data compiled as a result of using the four techniques mentioned above, I feel that a rather complete picture of the affectivity of the child will be obtained.

INTERVIEWING CHILDREN

The common justification for the use of interviews over more impersonal techniques such as personality inventories is the presumed facilitating effect of the personal relationship in the communication process. The direct contact in the interview provides an opportunity for the child to clarify unclear questions. Further, many children need the reassurance of an adult before they are able to express their negative

feelings such as aggression and hostility. On the other side of the coin, the presence of a strange adult asking questions to a child shapes his responses and is a source of variance difficult to control.

Yarrow (1960) points out that a useful procedure to establish rapport is to have the child bring to the interview some creative product. This gives the interviewer a better means of eliciting responses because the stimulus is something that the child himself has done and was actively engaged in creating. He also points out that with the pre-school child it has been traditional to define the interview as a play situation. In doing so, the examiner can use projective techniques to assess affective behavior, rather than having to rely on verbal responses to structured questions. In asking the child questions, two things should be kept in mind. First, the questions should be stated in terms that are familiar to the pre-schooler. Further, the form of the question should not lead the child to give a particular kind of response. In other words, it should be open ended.

An important consideration is that during the interview, the examiner should take note of various non verbal cues which are helpful in assessing affective behavior. These cues are as follows:

1. Physical posture, freedom, constraint, gestures, facial expression, energy output.
2. Physiological sweat, blush ..., etc.
3. Characteristics of Speech hesitation, rate, mumbling.
4. Interaction with the Interviewer attempts to control, manipulate, comply, restrain, depend.
5. Personality Style inhibition, extroversion ..., etc.

The general consensus about interviewing young children is that the interview questions should be as unstructured as possible. Because of the limited vocabulary of the pre-school child the interview, for our purposes, will be used as a method to establish rapport between experimenter and child, or as a gateway to facilitate responses from the child in the other methods used. It is the task of the interviewer to make the child feel that any response is satisfactory.

The typical interview will include questions such as these:

1. Tell me some of the things that make you happy; some of the things that make you sad.
2. How can you make your parents, sisters, brothers and friends happy? How can you make them sad?
3. When you get mad, What do you do?
4. What happens when you are bad at home?
5. How do you feel when you are alone?

The interview should be rather short and should be used to lead the child into the projective methods which seem more successful at probing the child's inner feelings. Stimuli should be in the form of toys and dolls. Lois Murphy (1956) points out that the material of play techniques vary with the investigator, but normally include an array of objects that the subject is to use, play with as he chooses, or arrange in accordance with some instructions. The miniature life toys of Murphy include dolls representative of family members, furniture, vehicles, soldiers, animals, cowboys, Indians and blocks. The instructions given to the child should be unstructured and the examiner should record verbalization and play sequences.

DOLL PLAY

The earliest use of dolls in an interview with young children was made by David Levy (1933) in studies of sibling rivalry. His standard equipment consisted of a steel "amputation" doll to represent a mother, a rubber brother or sister doll, a baby doll, and a toy chair. The child was told that "the mother has to feed the baby". Clay breasts were affixed to the mother doll, the baby was placed in position and encircled by the mother's arms. The mother was put in the chair and the doll representing the subject was placed near the chair. The child was then told, "Now this is the game. The brother (or sister) comes and sees a new baby at the mother's breast. He sees it for the first time. Now what does he do?" Levy classified the reactions according to four types of primitive patterns. The first was primitive hostility, shown in destruction of the baby or mother or parts of their bodies. The second was possessive hostility such as removing the breasts and placing them on the doll representing the self, or taking the baby away and making it the subjects own. Regression was the third pattern to be isolated, indicated by putting the subject doll to the mothers breast after removing the baby. The final type was self punishment varying from primitive murder of the doll representing the subject to milder forms of self punishment.

Bender (1953) studied the dynamics of aggression and hostility in children 3-15. In the doll test, the examiner pushed over a small doll three times and asked, "What has happened to it?" Then the child was encouraged to knock the doll down. Verbalizations were recorded. Cowboy, Indian and soldier dolls were introduced. The subject was asked,

"What are they doing? Why are they doing it? Is it right to do it?"

Sears (1951) used a six room roofless house containing five dolls recognizable as father, mother, boy, girl and baby. The child was allowed to play with the dolls and the examiner made an observational record of the childs aggressive play with respect to: frequency and amount, object and agent of aggression, type and latency. Each subject was observed twice. Each session lasted twenty minutes.

A valuable method to record activity during doll play was devised by Sears (1965). Here the subject's behavior is scored in behavior units. By this method, the unit is considered to be an act, thematic or non-thematic, which in its complete form is represented by an agent doing something to an object. For example, the daddy goes with the baby, the mommy gives the baby a bath. In recording the continuous flow of behavior, the observer splits the flow into units. Each unit contains an agent, act and object. A new behavior unit starts whenever there is a change in any one of these elements.

Following the brief warm up interview, each child will be allowed to engage in two doll play situations. Using two sets of family members dolls, the Sears technique will be used to assess the childs feelings about his family and about his peers. During the first session free play will be allowed with the family dolls including a mother, father, sister, brother, and baby. The examiner should record play sequences including the agent, object, and act that each sequence contains. For instance, a typical record should read: Child and father taken away from the rest of the family. Child says, "Let's go out Daddy." Father follows child out. At some point

in this session the examiner should impose a structure on the play. Questions should be asked about various relationships. Typical questions involving father and child dolls are: (1) What are they doing? (2) If this boy hit his brother what would the father do? (3) How does this boy feel when his father goes away? This same procedure should be used for the mother-child dolls.

In the second session the child will be allowed to play freely with a set of child dolls all of the same approximate age. The same kind of recordings by the examiner should be made as were done with free play family dolls. After this free play session, the examiner should again impose a structure on the doll play. One of the dolls should be designated as representing the child being assessed. Questions like the following should be asked: (1) Does your doll want to play with these other children? (2) Will they let you play with them? (3) What happens if this boy won't let you play? (4) Show me how you play with these other children.

RESPONSE TO PICTURES

In this part of the assessment procedure we will probe into the child's understanding of emotions by noting the labels he attaches to pictures showing various facial expressions.

Gates (1923) showed six pictures representing different emotional expressions to children 3-14 years of age. There was a gradual increase with age in the percent of approximately correct judgments. With allowances made for childish vocabularies, the pose for laughter gave 70% correct judgments even at age 3-4 and an increase to 100% at age 10. Surprise and contempt, on the contrary got practically zero scores at

age 3-5.

Our assessment procedure will make use of 9 pictures of people young and old, exhibiting certain emotional expressions. Three of these pictures will show varying degrees of happiness, three will be of people with unhappy facial expressions and three will be ambiguous or neutral. The child will be shown the pictures in a pre-arranged order and asked to attach a label to the picture. The experimenter will say, "Here is a picture that I want you to look at. Tell me how you think this person feels".

It is important that this technique be included in our assessment program because we will want to determine if the pre-school child has a knowledge of how people feel on the basis of their facial expressions. Further, this technique will help us decide if the feelings that a child says he has, by his verbal report, actually have conceptual meaning for him. For instance, we may find that a certain child cannot correctly label pictures showing sad expressions calling them, instead, happy. It would seem that the examiner should be wary of making interpretations about this child on the basis of his verbalizations. In short, this technique will allow us to determine how well a child can define what he feels and what others are feeling.

The next procedure to be used will be a standardized projective test. The two which seem most successful with young children are the Children Apperception Test and the Michigan Pictures Test.

Bellak (1944), believing that children identify more readily with pictures containing animal figures, created the CAT. The scenes reflect

various problems of childhood: feeding conflicts, sibling rivalry, toilet training, etc. The results are usually interpreted by keeping the following trends as guide lines; the main theme, main hero, needs of the hero, conception of the environment, significant conflicts , nature of anxieties and main defenses.

The Michigan Pictures Test, though useful in distinguishing well adjusted from poorly adjusted children in the school situation, is designed for school age children 8-14 years of age. For this reason the CAT seems preferable.

OBSERVATIONS

As a final assessment procedure, each child should be observed at least once in some natural setting, preferably the nursery school classroom, during free play. To assure some reliability in results obtained through observations, two people should observe each child.

Three methods have been used in assessing behavior through observations; rating scales, frequency of behavior records, and running records of the childs activities and behaviors.

Sears, Whiting, Nowlis and Sears (1953), used the direct observation of children to study aggression. They classified the aggressive behavior of children in nursery school into six categories: (1) injury to person (2) discomforting another (3) insuring compliance with demands (4) destruction of inanimate constructions or objects (5) taking things away from others (6) removal of immediate or anticipated frustration - retaliation, saving face. A child's occurrence in each category was summed and his total score was called his aggression index. Fifteen observations

of 15 minutes each were made on each child.

Levin and Sears (1956) investigated some antecedents of aggression in a group of five year old children by observing their behavior during two, twenty minute sessions of doll play. Action during the play was divided into units. Each child was classified in terms of the proportion of aggressive units in a session. The investigators used as units attempts to irritate, hurt, injure, punish or destroy dolls or equipment.

Arsenian (1943) used a ten point scale to rate the security of 1-3 year olds in a strange playroom. The scale varied from crying at one extreme to a free approach at another. Children were left alone in the room for up to five minutes and observed through a one way screen.

In a classic study Barker, Dembo and Lewin (1941) studied the relation between frustration and regression. First, pre-school children played with one set of toys. Then a more attractive but unavailable set of toys were exposed through a mesh screen. To study regressive reactions to frustration, the investigators tabulated signs of primitivation in children's subsequent play with the original set of toys.

The California Behavior Inventory is a rating technique. It consists of a list of numbered traits. Each trait in the inventory has been described by a suggestive heading and an elaboration or example of the heading. In this elaboration, the two extremes of the trait are fully illustrated and defined. The middle or average of the trait is stated more briefly. Each trait is rated according to a seven point scale.

Sears (1965) used the frequency technique to assess aggressive behavior. Two five point scales were used. The first was an estimate

of the frequency and extent of acts directed against other children and adults. Some of the examples given were punching, hitting, pushing, throwing and grabbing things, ruining others work, teasing and threatening. The second scale was designed to reflect the frequency and extent of non-personal acts, or acts directed at objects such as deliberately spilling water or paints or beads, tipping over blocks, sweeping things off a table or knocking things down. The scores on the two scales were averaged to secure a single measure of aggressiveness for which inter-relator reliability was .87.

For our purposes, the most practical recording device for assessing a childs behavior in a natural setting is to keep a running record of the childs activities and interactions with his environment, directing our attention to aggression, fear, dominance, submission, dependency and the like. In this way we can get a complete picture of how the child behaves in a particular time period; what he does, who and what he does it with, and the behavioral means by which he interacts. If we observe a child once or twice, this seems to be the only technique which will give us some comprehensive view of his personality style. From this record, we can extract frequencies of particular patterns of behaving and reacting.

7. SOCIAL BEHAVIOR

Helaine Gold

Assessment in the area of the social behavior of pre-school children has been done with a variety of methods. These include the use of projective techniques, doll play, sociometry, interviews of parents and teachers, ratings by parents and teachers and direct observation of children in various play settings and social interaction situations. Projective techniques such as stories, sentence completion and the CAT measure the fantasy life of a child. That is, they can give information about the sort of social life he fantasizes or dreams about but they are not necessarily an index of how he actually behaves in social interactions. Likewise, doll play can judge perhaps a child's potential for aggressive play or the type of play he may engage in with other children but it its not a valid indicator of what he does do. Sociometry, a technique developed by Moreno, allows the child to indicate which of the children in his group he would like to play with, like to visit at home, etc. In this way one may develop a picture of the structure of the group, which children are preferred as playmates and which are isolates. However, the method does not seem very useful for the individual assessment of a child's interaction with his peers and with adults. The most useful methods for assessing the social behavior of a child would appear to be ratings by parents and teachers and direct observation of the child in interaction. Since direct observation has been the preferred method in studying children's social behavior, some of the methods of observation and problems surrounding these methods will be discussed.

Wright (1960) lists five different methods of observing and recording the social behavior of children. The first of these is diary description. In this well-known technique a diary is used to draw sequential accounts of behavior changes in a child. A second method is specimen description which consists of "the scheduled and continuous observing and narrative recording of a behavior sequence under chosen conditions of time and life setting." Both the child and the interacting environment are described. A third method widely used in studies of early childhood social behavior is time sampling in which selected aspects of the child's behavior, as it occurs in uniform and short time intervals is recorded. Time sampling is limited in that it usually indicates only incidents of behavior. Further, it tells little about the total situation. A fourth mehtod is event sampling. Here specific, integral behavioral events of a given class are studies, e.g., arguments, games. A new type of observational method is field unit analysis. This method has two phases. First, a behavior sequence is divided into consecutive units in the field on the basis of explicit rules. Then descriptive categories are applied to the phenomemon of each unit. A final method is trait rating, where an observer watches the child and then rates him on a series of scales.

Optimum size of the behavior unit is a problem in this area. It may vary from single acts (the recording or observation of a certain class of acts) to interactions (situations in which two or more children are being observed and the recorded unit includes facts about the behavior of more than one child) to interperscnal activities which indicate contact of some duration. Wright suggests that a basic unit of description should

be: (1) able to be used in the field (2) take in a diversity of behavior and situation variables (3) have psychological integrity (4) have clear meaning in terms of some central criteria (5) permit study of behavior in context.

Major problems in regard to observational methods have been discussed by several authors (Wright, 1960; Gellert, 1955). One of these problems is that of observer influence or how much the child's actions are affected by the fact that he is being observed. Methods used to alleviate this problem have been one-way mirrors and viewing by television. Where the child is aware of the observer's presence, it cannot be assumed that effects will be distributed evenly over children or over groups. That is, some children and some groups will be affected more by the presence of an observer than will others. However, that will be lost by the modification of certain forms of behavior by the child being observed will be more than gained by the wider access the observational method gives to behavior which could not be obtained in a laboratory setting.

Another problem of observation is that a reliability. In general, observer agreement has been fairly high, between 85 and 90%. A final problem in observation is the method of recording. The observer may either try to take down as much of the behavior as possible or he may use preset categories. In general, when a few categories of behavior are being used, it would seem to be a good idea to use preset codes or letters to indicate when the particular behavior occurs. When many categories are being used, however, it is probably better to record as much of the action as possible and then categorize later. In observation one may use

the man-to-man approach where one observer follows one child or the "zone defense" where a given observer watches a certain area of the field. One must also decide whether one wishes to record acts on the basis of intent (i.e., an act of aggression when there is apparently the intent to aggress) or whether one wants to see the effect of aggression before calling an act aggressive. Generally, describing an act on the basis of intent involves more of an inference than does judging it on the basis of its effect. Finally, in all observational situations one would want to control for the effect of instigation. That is, one wants to be as sure as possible that no one child is put in a situation where the instigation to aggress, or to sympathize, or to do any number of other things, is greater than it is for another child. The conditions of observation should thus be made as similar as possible for all children.

HISTORY AND REPRESENTATIVE SAMPLES OF OBSERVATIONAL TECHNIQUES

The technique of systematic observation as a research method was developed in the late 1920's and early 1930's by Olson (1931), Thomas (1929), and Arrington (1932). Social behavior in pre-school children has generally been measured in two ways, in a holistic fashion attempting to quantify the level and type of interaction (Parten, 1932, 1933; Moustakas et al., 1956; Bridges, 1931; and Bishop, 1951), or by studying some specific type of behavior (Heathers, 1955; Faigin, 1958; Sears et al., 1953; Gellert, 1961; Murphy, 1937, Anderson, 1937; and Chittenden, 1942). The types of behavior most commonly studied include affiliation, aggression, ascendancy, conformity and cooperativeness, fear and insecurity, extra-

version-introversion, and sympathy and social sensitivity.

Heathers (1955) measured dependency using adult Ss. She developed four categories of dependence and six of independence. Sears, et al. (1953) also studied dependency using five categories. These categories were instrumental acts designed by the child to place himself in such contact with another person as to provide gratification of the acquired drive of dependency. A total dependency score for each child was secured by summing the frequencies over all categories for 16 observations of fifteen minutes each. Children's ages in this study ranged from three years-four months to five years-five months.

Several studies have been made of aggression in pre-school children. Faigin (1958) used a set of categories to study the frequency of aggressive behavior displayed by children of 2 Kibbutzim. Time samples were taken of the behavior of each individual child in ten or fifteen minute time units. She obtained three hours of systematic observation on each child, time periods being allotted to the various activities in which the child engaged during his day. Ages ranged from 19 to 38 months. Sears et al. (1953) also studied aggression. Each child was observed for 16 fifteen minute periods and aggressive behavior was recorded under six categories. These categories were defined as instrumental acts designed by the child to place himself in such contact with another person as to provide gratification of the acquired drive of aggression.

Domination has been measured in a variety of ways in young children. Gellert (1961) placed pairs of children in the same room. The same pair of children were observed each day. Behavior was recorded in terms of unit acts. Any scorable action or verbalization that was

terminated by interruption as a result of another person's acts, by change of intent, change of direction, or by the addition of new ideas on the part of the subject was considered to be an act. Categories of behavior were of three types: domination, submission and resistance. For each dominance category, subjects were ranked in terms of frequency of acts. The sum of each child's rank position on each category of dominance was his composite score. The dominance behavior had to be initiated by the subject. It was scored in terms of apparent intent, not outcome. H.H. Anderson (1937) studied the dominative and integrative behavior of children of pre-school age. There were eight categories for domination behavior, and four for integration behavior. Children were observed in pairs and paired five times with different partners. With each partner children were observed for five minutes. Chittenden (1942) used categories of domination, cooperation and non-assertion. Children were observed for five minute periods in a controlled situation. A child's score on each behavior category consisted of the total number of such items shown by him throughout the five pairings.

Finally, L.B. Murphy (1937) observed sympathy behavior in young children. Objective diary records were kept of the responses of the child to distress situations occurring spontaneously in the play group. Ten categories were used to measure sympathy.

Other investigators, as mentioned above, have developed ways of quantifying overall social interactions. Bridges (1931) developed a scale for social development, one for peer relationships and one to measure relations with adults. In these scales Bridges reports that children should

be observed daily for a month during school hours. Observation periods should be three or more hours a day and should take place at different times during the day. The observer should take notes on the child's behavior. At the end of the period of observation, O indicates whether the first alternative applies (1), or the second (0), or whether he is uncertain (-). With large-scale assessment programs it would seem preferable to allow nursery school teachers to complete records such as these on each child since the amount of observing time required is so great.

Parten (1932) developed a scale to measure the level of a child's social interaction. The observations are carried out at the same period each day (usually periods of free play). A method of time sampling was used and each child was observed for one minute daily. The children were observed over a period of six months, with about 72 one minute observations for each child. There were six social participation levels, each assigned a scale weight. The child's total score was the sum of the weighted scores.

Bishop (1951) has developed a category system for studying parent-child relationships. There are two sets of categories; one referring to the mother's behavior, the other to the child's. One block square for each five seconds of 30 minute play sessions between parent and child were used to record observations. The observer recorded the status of the interaction in each five second interval. Mother and child were left alone in a playroom for two half hour periods while an observer watched from outside. A frequency score is obtained per category by

summing over the five second intervals.

The most elaborate system has been one designed by Moustakas et al. (1956), an adaptation of Bishop's scale. The behaviors of child and adult are recorded individually for each five second period. Sixteen minutes of continuous recording is used. For each five seconds there is a separate time period square. Although more than 34 general categories are used, with specific behavior in some, category reliability is above 80 per cent and observer reliability is between 88 and 99 per cent.

AN ASSESSMENT PROGRAM

For purposes of assessing the social development and behavior of pre-school children, a variety of methods should be used. These may be broken down into four types. First, interviews of parents and teachers and ratings of the child's social behavior as seen by these adults should be obtained. Second, the child should be interviewed by a person not familiar with him. Third, direct observation of mother-child interaction should be made. Finally, the child should be observed in interaction with his peers. These four types of assessment procedures will now be more thoroughly discussed.

First, teachers should rate each child on both of the Bridges' scales (see Appendix). If possible, an interview should be held with the mother of each child, during which information about the child's relations with peers, siblings and adults could be explored.

Second, a nonfamiliar observer could interview and play with the child. A fifteen to twenty minute period would appear optimal. Two

observers should interview each child. The observer should note and write up such aspects of the interview as how the child approached him, how long it took before the child appeared to be comfortable, the manner of the child's relating (talking, seeking praise, ignoring O, inviting O to play games, asking questions, asking for help) and any signs of anxiety or discomfort on the part of the child.

Third, if possible, mother and child should be observed together in a separate playroom, through a one-way mirror. A modification of Bishop's technique and scale could be used. It is suggested that rather than merely recording the categories of interaction, running accounts should be made. These accounts are by no means expected to be complete, but would indicate the kinds of behavior which Bishop uses in her scales, so that behavior could be categorized at a later time. It is suggested that observers record for five minutes and then rest for five minutes. Two periods of thirty minutes each would seem to be optimal. At the same time, Sears' categories for observation of dependent behavior (which overlap with many of Bishop's categories) could also be kept in mind, to be scored later.

Finally, a running account should be kept of the child's interaction with other children. Again, behavior should be recorded for five minutes at a time for a total of thirty minutes. Free play situations would appear to be the optimal type in which to record such behavior. While recording, Parten's social interaction categories, Sears' categories of aggression and Chittenden's categories of dominative and cooperative behavior should be kept in mind. Recorded behavior may later be scored according to all three types of measuring instruments.

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